

INPUT®

Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 (201) 801-0050
Fax (201) 801-0441

FAX TRANSMITTAL FORM

Date: Oct 13
To: Name: Dave Cedrone
Tel./Location: 508-952-3916
Co.: OBC
Fax No: 508-952-3023
From: Tom O'Flaherty
Subject: "Thank You" Package
Draft

Confidential: ☒ N
Urgent: ☒ N

Page: 1 of 6

File: Chron
Contact
Other:

This is what I spoke of in my voicemail.

I don't think that any sensitive material is being released, but let me know your reaction.

OK 19
Oct



INPUT*

Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 (201) 801-0050
Fax (201) 801-0441

FAX TRANSMITTAL FORM

Date: Jan 5 Confidential: Y/N
To: Name: Rose Urgent: Y/N
Tel./Location: _____
Co.: _____
Fax No.: _____ File: Chron
From: TR Contact
Subject: Jenny Rucker YNDC2 expense Other:

	<u>Aus \$</u>	<u>US \$</u>
Interviews		<u>720.00</u>
Tel exp	<u>195.00</u>	
Fax exp	<u>86.40</u>	

Attached approved invoice
c/o

Send check to her husband in U.S.

Paul Rucker his tel 708-292
9399 W. Higgins #700 2160
Rosemont IL 60018
~~W~~

(The invoice you sent were from the
1991 worldwide study)



JARCO PTY. LTD.

A.C.N. 009 359 979

26 Tilton Tce., City Beach W.A. 6015

Telephone: 385 8088

INPUT

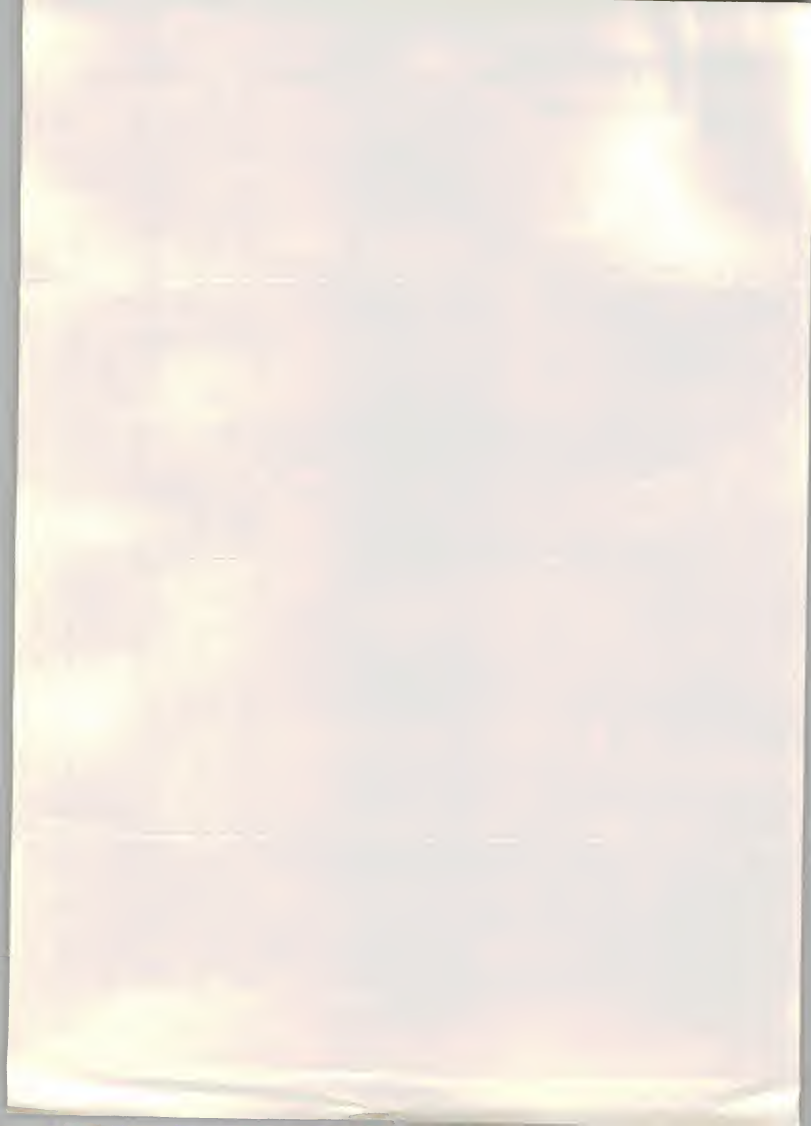
Atrium at Glenpointe,
400 Frank W. Burr Blvd,
Teaneck,
NJ 07666

19th June 1992

Invoice for participation in the communications
survey for Australia, Hong Kong & Singapore.

Fax expenses (as per attachment)

OK DM
A\$86.40
=====



19-JUN-1992 15:26

B H P IRON ORE LTD3204090

09 320 4090 P.03

JARCO PTY. LTD.

A.C.N. 009 389 979
26 Tilton Ter., City Beach W.A. 6015
Telephone: 385 8088

INPUT

Atrium at Glenpoints,
400 Frank W. Burr Blvd,
Teaneck,
NJ 07666

19th June 1992

Invoice for participation in the communications
survey for Australia, Hong Kong & Singapore.

Telephone expenses (as per attachment)

OK *PK*
A\$195.00

I don't have the Fax expenses at present but
will send that a.s.a.p. when I receive it.

~~1200~~ c1/

[Handwritten signature]

WED 21 JUL

1944

DE 1158
TO 1158
FROM 1158
SUBJECT: 1158

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19-JUN-1992 15:26

B H P IRON ORE LTD3284290

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JAPCO PTY. LTD.

A.C.N. 009 389 979
26 Tilton Tce., City Beach W.A. 6015
Telephone: 385 8088

INPUT

Atrium at Glenpointe,
400 Frank W. Burr Blvd,
Teaneck,
NJ 07666

19th June 1992

Invoice for participation in the communications
survey for Australia, Hong Kong & Singapore.

9 interviews @ US\$80 per interview

US\$720.00

US\$720.00

* If it is easier to pay this in U.S dollars than to
convert to A\$ then it can be paid to my husband Paul
Ricker and mailed to him at G. Heilemann Brewing Co.,
9399 W. Higgins Rd, Suite 700, Rosemont, Illinois 60018.

OK
6/22/92

RECEIVED BY THE

U.S. DEPARTMENT OF JUSTICE

WASHINGTON, D.C.

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*** ACTIVITY REPORT ***

TRANSMISSION OK

TX/RX NO.	0651
CONNECTION TEL	1 415 961 3967
CONNECTION ID	PROD
START TIME	01/05 11:05
USAGE TIME	02'32
PAGES	4
RESULT	OK



FACSIMILE MESSAGE

TO INPUT (NJ)
ATTN TOM O'FLAHERTY
FAX No 0011 1 201 801 0441
FROM JENNY RICKER
SUBJECT _____
DATE 24/7/92
PAGES + HEADER 3

COPY TO/FAX No

IF NOT RECEIVED SATISFACTORILY, PLEASE TELEPHONE +61 9 320 4065

MESSAGE:

FAX EXPENSES - WILL SEND ORIGINAL IN MAIL.FROM 1ST AUGUST THE FAX NO. YOU HAVE BEEN
USING WILL NO LONGER BE AVAILABLE.TO CONTACT ME YOU CAN USE 09-324-1354

10/12/2012

NAME	Mr. John Doe
ADDRESS	123 Main St, Apt 4B, New York, NY 10001
CITY	New York, NY
STATE	NY
ZIP	10001
PHONE	(212) 555-1234
EMAIL	john.doe@example.com
DATE	10/12/2012
I hereby certify that the above information is true and correct.	

Signature: _____
Name: Mr. John Doe
Address: 123 Main St, Apt 4B, New York, NY 10001
City: New York, NY
State: NY
Zip: 10001
Phone: (212) 555-1234
Email: john.doe@example.com
Date: 10/12/2012

Office
Use

Itemised Call Details

STD calls

	Date	Time	Place	Number	Rate	Min:Sec	\$
3-3	01 Apr	01:09 pm	Melbourne	036463570	Day	7:12	4.32*
3-4	01 Apr	01:23 pm	Melbourne	036668682	Day	6:32	3.84*
3-5	01 Apr	01:31 pm	Melbourne	032684985	Day	6:17	3.84*
3-6	01 Apr	01:38 pm	Sydney	029570354	Day	6:23	3.84*
3-7	21 Apr	09:41 am	Melbourne	036463570	Day	0:47	0.50*
3-8	21 Apr	09:42 am	Sydney	029025111	Day	0:45	0.50*
3-9	21 Apr	09:49 am	Melbourne	032684985	Day	0:47	0.50*
4-1	21 Apr	09:50 am	Sydney	029570354	Day	0:44	0.50*
4-2	22 Apr	08:36 am	Coffs Harbor	066511115	Day	0:09	0.25
4-3	22 Apr	08:36 am	Moora	096511115	Day	1:03	0.50
4-4	05 May	08:04 pm	Bakers Hill	095741560	Night	3:24	0.75
4-5	13 Jun	05:15 pm	Beedelpup	097762020	Day	1:24	0.75

0011 IDD International calls

	Date	Time	Place	Number	Min:Sec	\$
5-1	01 Apr	12:40 pm	Singapore	652235800	0:47	1.20*
5-2	01 Apr	12:42 pm	Singapore	652235800	6:34	9.84*
5-3	01 Apr	12:50 pm	Singapore	657794880	2:21	3.60*
5-4	01 Apr	12:54 pm	Singapore	657794880	5:17	7.92*
5-5	01 Apr	01:02 pm	Singapore	657794880	6:17	9.60*
5-6	01 Apr	01:48 pm	Hong Kong	8525644402	6:23	9.60*
5-7	01 Apr	01:55 pm	Hong Kong	8528109911	8:48	13.20*
5-8	01 Apr	02:02 pm	Singapore	653385202	0:47	1.25*
5-9	21 Apr	09:44 am	Hong Kong	8525644402	0:47	1.25*
5-10	21 Apr	09:46 am	Singapore	652235800	1:00	1.50*
5-11	21 Apr	09:47 am	Singapore	653385202	1:08	1.75
5-12	29 Apr	12:40 pm	USA Columbia	12022349139	0:48	1.00
5-13	13 Jun	07:06 pm	USA Columbia	12022349139		

Are you having difficulties paying?

If you have any difficulties in paying your bill, please call us during business hours on the billing enquiries number. Payment assistance options available for residential services include more frequent billing, the Budget Payment Card or other arrangements.

Telephone rental concession voucher

If you have a Telephone Rental Concession Voucher please enclose it with your payment if paying by mail or bring it with you if paying in person.

Please note that these vouchers cannot be accepted if the "Pay by Phone" method is used.

Metered calls

Includes local calls and other calls not separately listed on your bill.

A meter connected to your service at the local exchange records the call charges in units. Each unit is equal to the price of a local call.

Are you moving?

Now is the time to contact the Sales Section of the Telecom Office that services your new address.

Telecom Offices are listed in the Information Section of the White Pages Telephone Directory.

Credit card payments

Bankcard Card number	Mastercard	Visa	Redicard
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Expiry Date

Signature

Item	Description	Amount	Percentage	Total
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INPUT

Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 Tel. (201) 801-0050
Fax (201) 801-0441

July 16, 1992

Mr. Dave Cedrone
Digital Equipment Corporation
153 Taylor Street (TAY 2-1/B16)
Littleton, MA 01460-1407

Dear Dave:

Attached are bound copies of the study INPUT recently completed, "The Business Opportunity for Offering Connectivity and Value-Added Services to the Global Marketplace". These copies should be identical to the unbound copies you received previously.

After I return from vacation, I'll give a call to see if there is follow up we can discuss.

Sincerely,



Thomas O'Flaherty
Vice President

a:tof:DEC-DC



(UNITED STATES)
Dick Calandrella
Digital Equipment Corporation
(508) 496-8626

(AUSTRALIA)
Peter Davidson
Digital Equipment Corporation
011-61-2-561-7098

(AUSTRALIA)
David Foster
Optus Communications
011-61-2-238-7723

OPTUS COMMUNICATIONS SELECTS DIGITAL AS PRIME CONTRACTOR
IN \$1 BILLION (AUS) SYSTEMS INTEGRATION TELECOM PROJECT

MAYNARD, Mass. -- July 9, 1992 -- In a strategic agreement estimated to be worth \$1 billion (AUS) over the next 10 years, Digital Equipment Corporation was named as the prime contractor to provide the complete information technology and service needs for Optus Communications, the second largest telecommunications carrier in Australia.

Under terms of the agreement, signed in Sydney, Australia on June 22, 1992, Digital will serve as the prime contractor to Optus to develop an Operational Support System (OSS) for what will be the world's first fully digital telecommunications network.

OSS includes the network operating systems and applications software required to manage the many elements of a digital telecommunications network.

THE UNIVERSITY OF CHICAGO
LIBRARY
CHICAGO, ILL.
1911

THE UNIVERSITY OF CHICAGO
LIBRARY
CHICAGO, ILL.
1911

Building Australia's Second Telecommunications Network

Optus, which secured the right to operate Australia's second telecommunications network in November 1991, is a consortium of Bell South, Cable and Wireless, and several Australian firms.

Plans call for digital cellular facilities to cover 80 percent of the population, with fibre transmission facilities built to cover most major centers by 1997. This will provide virtually all of Australia with access to Optus' services.

Under terms of this contract, Digital will be responsible for the systems integration, management, training, and operation of the entire information technology needs of Optus, and, in effect, become the information technology arm of Optus.

Other strategic contractors involved with Digital are:

- * Nortel Australia Proprietary Limited
(for the switching equipment)
- * Fujitsu Australia Limited
(for the transmission equipment)
- * Nokia Telecommunications
(for the digital mobile systems)
- * Leighton Contractors Proprietary Limited
(for the building construction)

Optus Chief Executive Officer, Bob Mansfield, described the agreement as one of the largest contracts in the world for development of a fully integrated OSS.

"This agreement will see the establishment by Digital of a global OSS Support and Development Center in Australia," Mansfield said. "Digital will also commit its international marketing resources to develop an export market for OSS with the potential to earn up to \$1 billion (AUS) for new Australia-developed technology over the next decade," he added.

Mansfield also noted that Digital had won its position by offering solutions and a business plan which will provide world-class service and long-term export growth for Australia to other carriers and private network operators.

Frank Wroe, Digital-Australia Chairman, said that the agreement with Optus "is a highly significant challenge to Digital. We are involved with every major telecommunications provider in the world, but Australia will move quickly to become a leader in fully-integrated open systems, using fibre technology in end-to-end digital networking."

Russ Gullotti, worldwide Vice President of Digital Services, noted that "this agreement with Optus is the largest single systems integration and services contract we have signed anywhere in the world, and we are excited by the challenges and opportunities it will provide in the global telecommunications arena."

OSS Potential For Export

OSS will allow Optus to provide superior customer service, and a software product for export.

It will also be the first fully integrated OSS. Previous projects attempted to integrate a mix of mechanical, analog, and digital technologies that existed in established networks.

Digital will be the principal marketer of the new systems through its global operations, and is examining joint venture opportunities with Optus.

THE SECRETARY OF THE ARMY
WASHINGTON, D. C.
JANUARY 1, 1900
SIR:
I have the honor to acknowledge the receipt of your letter of the 29th inst. in relation to the matter of the appointment of a chaplain to the 1st Cavalry, and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.
Very respectfully,
J. H. COOPER, Secretary of the Army.

Digital Equipment Corporation, headquartered in Maynard, Massachusetts, is the leading worldwide supplier of networked computer systems, software and services. Digital pioneered and leads the industry in interactive, distributed and multivendor computing. Digital and its partners deliver the power to use the best integrated solutions - from desktop to data center - in open information environments.

###

CORP/93/720

Distribution:

TO: PAM HAMILTON	(PAM HAMILTON@1=US@2=MCI@*EMS\COMPUSE
TO: TLINEHAN	(TLINEHAN@1=US@2=MCI@*ID\5112573@MRX
TO: Diane Ellis	(Diane Ellis@1=US@2=MCI@*ID\5102572@M
TO: * MRKTNG::BELON AT al at POWDML at pko	
TO: DIANA ZELTSER @FKO	

Use the RDL option to see remainder of distribution lists.

THE UNITED STATES OF AMERICA
DO hereby certify that
[Name] is a citizen of the United States of America
and is entitled to the rights and privileges of citizenship
under the Constitution and laws of the United States.

WITNESSETH

ATTEST

NOTARY PUBLIC

My commission expires on [Date]
[Signature]
[Name]
[Address]

My commission expires on [Date]
[Signature]
[Name]
[Address]

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of my office at [City], [State], this [Date] day of [Month], [Year].

INPUT

1280 Villa Street, Mountain View, CA 94041 (415) 961-3300
Fax (415) 961-3967

FAX TRANSMITTAL FORM

Date: 11/19/92
To: Name: Tom O
Tel./Location: _____
Co.: _____
Fax No: _____
From: Renee
Subject: JAACO Invoices

Confidential Y N
Urgent Y N

Page: 1 of 3

File: Chron
Contact
Other:

There are no original invoices in
Payables for WDC2. We have made
no payments since December of 1991.

When you had me send the invoice to
DEC you sent the following as back
up. Is this what they are looking for?
Did you ever get the final Tax expenses
from them?

INPUT

NAME: _____
 ADDRESS: _____
 PHONE: _____

YOUR INFORMATION

NAME	_____
ADDRESS	_____
PHONE	_____
DATE	_____
TIME	_____
LOCATION	_____
REMARKS	_____

1. I am a member of the _____
 2. I am a member of the _____
 3. I am a member of the _____

4. I am a member of the _____
 5. I am a member of the _____
 6. I am a member of the _____
 7. I am a member of the _____
 8. I am a member of the _____

**THE BUSINESS OPPORTUNITY FOR OFFERING
CONNECTIVITY AND VALUE-ADDED SERVICES
TO THE GLOBAL MARKETPLACE**

Findings and Recommendations

Prepared for:

**DIGITAL EQUIPMENT CORP.
CORPORATE TELECOMMUNICATIONS**

June 3, 1992

INPUT

The Atrium at Glenpointe
400 Frank W. Burr Boulevard
Teaneck, New Jersey 07666

201-801-0050
Fax: 201-801-0441



I. INTRODUCTION

A. Background

INPUT was engaged by Corporate Telecommunications (CT) to assess the opportunity for offering end-to-end connectivity and value-added services to the global marketplace. The range of services that could be offered to the market is shown in Exhibit I-1.

The study covers the following issues:

- The size and nature of the overall opportunity
- The geographic differences in the opportunity, i.e., between the U.S., Europe and Asia/Pacific
- Differentiating the opportunity between Levels 1b, 2 and 3 on Exhibit I-1.
- Assessing the perceptions of Digital's capabilities to offer these services as viewed by potential customers.
- The risks of entry, both market-based and regulatory.
- The organizational implications of addressing the opportunity

These initial objectives were modified somewhat, as will be described below, after the initial results of the study were reviewed with CT.

Preliminary results were presented at a CT staff meeting in Rochester, New York on April 3, 1992. As result of that meeting it was agreed to expand the survey base from global companies to include a more diverse selection of companies (see "Methodology", below). There were also several adjustments made to the questionnaire, principally to include more detail on OSI plans for companies where this was a priority.

There was a later telephone conference review on May 15, 1992 with the Digital project managers to verbally review findings. The major result of that review was agreement to include information on additional market opportunities that were outside the scope of the initial study, based on existing INPUT materials and assessments. This material is included in Chapter IV.



B. Methodology

The original methodology was aimed at interviewing 36 large international companies in the U.S., Europe and Asia/Pacific. As a result of the April 3 briefing it was agreed that the interview program should be further expanded to cover a more diverse set of companies in the U.S. and Europe to see if there were additional opportunities beyond international companies.

- Twenty additional interviews were added, as shown in Exhibit I-2.
- U.S. respondents were divided into ten multi-billion dollar companies and 14 companies that were in the \$500 million - \$1 billion class (Exhibit I-3).
- European interviews were segmented as follows:
 - European-based firms with a global focus
 - Firms with a European focus
 - Enterprises with primarily a single-country focus
 - Firms interviewed are shown in Exhibit I-4
 - Note: In subsequent analysis it turned out that the differences between European firms was generally relatively slight, consequently exact classifications became less important.
- Asia/Pacific interviews are shown in Exhibit I-5.

Respondents were well informed and able to answer virtually all questions (in a few cases certain pieces of information were held to be proprietary). The most common title was "Director" within the telecommunications function; some vice presidents and managers were interviewed as well. (Less seniors titles were more common in larger enterprises with a specialized telecommunications planning function.)

The diagram in Exhibit I-1 proved to be very effective in ensuring consistent definitions and understanding across different geographies and languages.

Interviews were conducted locally in Europe, Asia/Pacific and the U.S. All interviews were conducted by telephone, except in Japan, where face-to-face interviewing is the cultural norm. In many cases respondents received a copy of the questionnaire before the actual interview; this was quite effective as a means of collecting quantitative information; in a few cases, respondents faxed a completed questionnaire back and there was subsequently telephone follow-up.

The size of the interview samples for particular geographies tended to be on the small side and some of the numeric computations consequently have a larger margin of error than usual. However, because so many of the key findings appear unambiguous, INPUT does not believe that a larger interview panel or more face-to-face interviews would have had a material effect on the results



C. Structure of this Report

This report is intended to capture key findings and recommendations in preparation for the voice conference meeting on June 3. For this report several secondary items have been omitted to save space and readers' time, among them:

- A copy of the questionnaire used.
- Exemplary comments from respondents
- Finer analytic breakdowns that turned out not to show significant differences (e.g., intra-European differences, vendor ratings for specific capabilities)

The final report will include this material, plus other points that may be raised at the June 3 meeting.



Exhibit I-1

Levels of Communication Services

3	Network-Based Applications (Examples)	<div>Electronic Mail (within an enterprise)</div> <div>Electronic Mail (between enterprises)</div> <div>Employee Locator (on-line)</div> <div>Electronic Data Interchange (EDI)</div>							
2	Enhanced Communications Services (Examples)	OSI	TCP/IP	DEC Net	SNA	Packet Switching	Frame Relay	Bulk Data Transfer	Video
1b	Value-added bandwidth (examples) <ul style="list-style-type: none"> Expedited delivery Quickly adjustable bandwidth Defined performance levels Cross-border service 								
1a	Pure bandwidth (e.g., tariffed circuits from carriers)								



Exhibit I-2

INTERVIEW DISTRIBUTION

U.S.	24
Europe	20
Asia/Pacific	<u>12</u>
TOTAL	56



Exhibit I-3

U.S. INTERVIEWS

Large Companies (\$1 billion plus)

Hughes

McDonnell Douglas

Northrop

Pepsico

Postal Service

Rockwell

Seagrams

Sears

Security Pacific

Wells Fargo

Medium-Sized Companies (\$500 million-\$1 billion)

Acustar

Alabama Power

American General Life

Baxter

Brooklyn Union

Citibank Mortgage

Commonwealth Electric

Gould Pump

InterAmerican Bank

Niagara Mohawk

Racal (U.S.)

Royal Insurance

Steelcase

University of Chicago



Exhibit I-4

EUROPEAN INTERVIEWS

Single Country Focus

British Coal

CCTA

Confederation

Lloyds

Preussag

Smiths

Societe General

Sollac

European Focus

Arjo

BOC

Ford Europe

Grand Metropolitan

ICI

Philips Petroleum (Europe)

Rank

Global Focus (European-based)

BP

Hoescht

Hoffman-LaRoche

Nestle

Shell



Exhibit I-5

ASIA-PACIFIC INTERVIEWS

BHP

BP

Cathay Pacific

Challenge Bank

Citibank (Singapore)

Hong Kong Bank

Mitsubishi Shoji

Nichirei

Nikki

Reuters (Singapore)

Thorn EMI

Westpac Bank



II. RESEARCH FINDINGS

The findings are organized into the following categories:

- Telecommunications expenditures
- Importance of data network issues
- Network-based applications opportunities
- Enhanced services opportunities
- "Value-added Bandwidth" service opportunity
- Vendor ratings

Note the terminology created in Exhibit I-1 ("network-based applications", "Enhanced Services" and "Value-added Bandwidth") has been used in this section for major categories.

A. Telecommunications Expenditures

One of the most important findings was that telecommunications budgets are expected to be flat worldwide (Exhibit II-1).

- This average is not the result of a number of high-growth companies balanced by negative growth companies. The majority of responses clustered quite close to zero. In fact, "zero" was the most common response to questions of overall growth.
- In-house personnel expenses are generally seen as growing in line with inflation, i.e., supporting a flat head count.
- Equipment and, especially, circuit expenses are seen as declining. Essentially, telecommunications departments are hoping to fund increased staff expenses with savings from outside vendors. One effect of this is for customers to place more emphasis on driving costs down from vendors rather than obtaining "improved service". This has implications for the proposed CT services that will be discussed at greater length later in this chapter.

It should be strongly noted that this flatness pertains only to "traditional" communications services which are supplied centrally. Two major exceptions to this spending pattern, systems integration services and LAN services/support, are discussed in detail in Chapter IV.



B. Importance of Data Network Issues

The relative importance of different issues that are facing communications operations has a significant impact on companies' usage of outside services. Exhibit II-2 shows the relative importance of major issues. (These issues are arranged according to the importance of the issues in large U.S. companies for purposes of comparison and contrast.)

- Reducing costs is exceptionally important in all geographies, except medium-sized U.S. companies, where it is still quite important. This finding is not at all surprising, given the direction of budgets.
- The large U.S. companies feel under pressure to make improvements across a number of areas:
 - Service quality and reliability
 - Staff skills
 - Responsiveness to both internal and external users

It is an open question, of course, how they will meet these goals in a no-growth environment.

- The other geographies have the same general priorities, but attach somewhat less importance to each issue. This probably shows both a better sense of what is practical. In addition, in some of these organizations telecommunications is relatively less important to the business. This last point is brought out clearly in the relative importance given to improving responsiveness to an enterprise's own customers:
 - Large U.S. firms attach considerable importance to this since, in many cases, these enterprises are communicating directly with customers.
 - This is less so in other geographies or for medium-sized U.S. companies.
- In general all companies showed low interest in outsourcing telecommunications functions. However, it should be noted that outsourcing interest and decisions usually take place at the general management level, as opposed to the technical management level.
- There was only modest interest generally in offering new communications services. This is consistent with the overall budget situation.



C. Network-Based Applications Opportunities

Exhibit II-3 shows the percent of respondents in each geography that are currently using specific network-based applications as well as their future plans for significant changes (either replacing a current offering or installing a new offering).

Internal E-Mail is heavily used in all geographies. Medium-sized U.S. companies are least satisfied with their current system and half are looking for replacements (or, more commonly, standardizing on one of multiple systems). This situation presents opportunities. However, opportunities appear to be for software product vendors: Virtually all current and targeted systems are software-based, resident on the customer's own network. The interest in a service based on a vendor's network is very small.

External E-mail systems currently in use (often integrated with the internal E-mail system) range from 80% penetration in large U.S. companies to 8% in Asia/Pacific. Future plans are more modest than for internal systems and, again, are almost all software based.

The penetration of employee locator systems is, broadly speaking similar to external E-mail, but at a lower level of intensity.

- The employee locator is also often integrated with the E-mail system.
- Similarly, these are all software-driven (and not provided as a service)
- Most importantly, there are few plans for additional changes.

EDI is fairly widely used, except in Asia/Pacific. Much of this function is executed in a service environment.

- However, there are relatively few plans for significant changes; most of the activities involve expanding the use of current systems and improving the underlying applications.
- This finding is consistent with INPUT's other information on the EDI market which comes from INPUT's subscription program in EDI.



D. Enhanced Services Opportunities

Exhibit II-4 summarizes the importance of enhanced services across geographies. These are arranged in the order of importance for large U.S. companies, which is also roughly the order overall, especially for the top half of the list.

- Obviously, SNA is of some importance to all companies, especially the largest companies with an SNA "tradition".
- TCP/IP is also relatively important. However, it should be pointed out that a ratings ranging from 3.1 to 3.6 are not especially impressive.
- There is some interest in OSI-based networks. It may be recalled that because of the high relative showing of OSI in the early interviews that it was agreed that more probes would be added to the enterprises that rated OSI relatively high. The results do not indicate very much current market activity:
 - Relatively few firms had implemented or were implementing OSI networks now; a few were engaged in testing, but it did not appear to be a high priority item.
 - Most firms that showed an interest were speaking in terms of potential future importance: Where timing was given (or known), milestones were usually several years in the future.

There are some additional differences in need by geography:

- Medium-sized U.S. firms place somewhat higher importance on OSI networks; however, all the caveats in the preceding paragraph apply to these firms also.
- The medium-sized U.S. firms place more importance on frame relay than any other group.
- Asia/Pacific, on the other hand places more importance on packet switching. These differences may relate to the relative maturity of the two geographic markets.
- The intensity of needs in Europe in general appear to be somewhat less than the other geographies.

In general, where enterprises are planning change and expansion, their plans assume utilizing the network (or networks) currently developed and under their control. There was a widespread feeling among respondents that current networks represented investments (or "sunk costs") that should be leveraged in applying new services or functionality. INPUT believes that this kind of thinking is responsible for network service providers such as Infonet or GEIS being somewhat less visible as service providers (see "F" below for more detail).



E. "Value-Added Bandwidth" Service Opportunity

A substantial minority of respondents in each geography say they are utilizing these services now (Exhibit II-5). The services provided fall into two general categories:

- Companies (generally larger companies) that have reached a critical mass in size and expertise are able to make special arrangements with carriers and/or manage their own networks in this fashion.
- Companies, especially overseas, view improvements in service or terms by Telcos/PTTs as falling into this category. This does not represent special treatment for a company, but an overall improvement in service levels, in excess of previous customer expectations.

In Europe and Asia/Pacific a quarter of respondents were considering such a service. However, this generally took the form of "We'll certainly consider any offering such as that". There was no indication that much, if any, higher price would be paid for such services beyond what they would pay a carrier themselves.

F. Vendor Ratings

One of the most important aspects of the study was to learn how Digital would be viewed as a vendor in this market. There are two considerations:

- How visible is Digital as a vendor or potential vendor? That is, if only a few potential customers viewed Digital as a serious entry, it would matter far less that Digital was rated highly by those who did have an opinion.
- Once the visibility hurdle has been surmounted, the question is: How capable is Digital viewed?

The answers to both questions are quite positive:

- Digital has good to excellent "visibility" in every geography (see Exhibit II-6, which is arranged in the order of visibility in large U.S. companies). Very little separates Digital from the leading company in each geography -- in fact, Digital is the leading company in Asia/Pacific. While respondents were not asked why they felt able to rate Digital, INPUT believes the following factors are involved:



- In the U.S., Digital has benefited from a few very visible outsourcing contracts.
- There is a tendency to give large, technology-oriented companies "the benefit of the doubt" in this kind of situation.
- Digital is well-known for its networking efforts and perhaps its recent communications-oriented positioning has borne fruit.
- Somewhat more surprising is the generally good marks that Digital receives for actually being capable of supplying such services (Exhibit II-7). Except in large U.S. companies, Digital actually rates first or second in each geography.
 - These ratings are even more impressive since Digital has not been offering these services on a standalone basis.
 - Obviously, the same kind of "halo" effects described in the previous paragraph are operating here as well.
 - It seems ironic that Digital rates higher than GEIS or Infonet as they have been offering some of these services for quite some time.
- Note also that PTTs in Europe and Asia/Pacific receive equivalent ratings to U.S. RBOCs. The verbal comments of respondents indicate the PTTs as a group are trying much harder to deliver services and are viewed as increasingly responsive.

Finally, it is not necessary for Digital to offer a full set of telecommunications services, i.e., be a sort of telephone company. Except for Asia/Pacific, a very large majority of respondents were willing to pick and choose services and deal with multiple vendors to get the services and benefits that they needed (Exhibit II-8).



Exhibit II-1

EXPECTED TELECOMM BUDGET GROWTH

<u>Geography</u>	<u>Range</u>	<u>Median</u>
US - Large	-25% to 15%	0
US - Medium	-20% to 100%	0
Europe	-20% to 16%	0
A/P	-10% to 50%	-2%



Exhibit II-2

**IMPORTANCE OF DATA NETWORK ISSUES
IN EACH GEOGRAPHY**

Change	Importance*			
	U.S.		Europe	A/P
	Large	Medium		
Reduce costs	4.8	3.9	4.4	4.1
Improve service quality	4.2	3.8	3.5	3.8
Improve service reliability	4.2	3.4	3.6	3.8
Improve staff skills	3.9	4.4	3.2	3.6
Improve responsiveness to internal users	3.8	3.1	2.7	3.0
Improve responsiveness to customers	3.8	3.4	3.4	3.7
Reduce head count	3.0	2.1	3.0	3.0
Offer new communications service	2.5	2.7	3.1	3.1
Outsource services or functions	1.7	2.1	2.8	2.1

Note: Differences of 0.4 or less are not significant.

*** 1 = low 5 = high**



Exhibit II-3

NETWORK-BASED APPLICATIONS BY GEOGRAPHY

(% of Respondents)

		<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
		<u>Large</u>	<u>Medium</u>		
E-mail (Internal)					
•	Currently in use	80%	100%	75%	83%
•	Significant changes planned	30%	50%	10%	10%
E-mail (External)					
•	Currently in use	80%	50%	25%	8%
•	Significant changes planned	30%	21%	--	--
Employee locator					
•	Currently in use	60%	29%	10%	8%
•	Significant changes planned	10%	--	--	--
EDI					
•	Currently in use	50%	57%	60%	17%
•	Significant changes planned	--	21%	10%	--



Exhibit II-4

IMPORTANCE OF ENHANCED SERVICES IN EACH GEOGRAPHY

<u>Service</u>	<u>Importance*</u>			
	<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
	<u>Large</u>	<u>Medium</u>		
SNA	3.8	3.2	3.3	3.6
TCP/IP network	3.5	3.6	3.3	3.1
OSI-based network	3.0	3.4	2.8	2.6
DECNet	3.0	2.9	2.7	2.9
Video	3.2	3.3	2.3	2.3
Bulk data transfer	3.0	3.0	2.4	2.8
Frame Relay	2.5	3.6	2.3	3.0
Packet Switching	2.4	2.5	3.1	3.6

Note: Differences of 0.4 or less are not significant.

*** 1 = low 5 = high**



Exhibit II-5

USE OF "VALUE-ADDED BANDWIDTH" SERVICES

	<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
	<u>Large</u>	<u>Medium</u>		
Using "Value-added Bandwidth" Now	30%	29%	42%	25%
Not using, but considering	10%	—	25%	25%



Exhibit II-6

**"VISIBILITY" OF POTENTIAL COMMUNICATION
SERVICES VENDORS
(% of Respondents Able to Rate)**

<u>Vendor</u>	<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
	<u>Large</u>	<u>Medium</u>		
AT&T	90%	93%	60%	92%
IBM	90%	93%	65%	92%
Telcos*	90%	86%	55%	83%
DEC	80%	79%	55%	100%
EDS	80%	43%	10%	50%
BT	60%	43%	75%	92%
GEIS	50%	50%	40%	75%
Infonet	50%	10%	35%	42%

***RBOC(s) in U.S.; PTT(s) elsewhere**



Exhibit II-7

RATINGS OF COMMUNICATION SERVICES VENDORS

	<u>U.S.</u>							
	<u>Large</u>		<u>Medium</u>		<u>Europe</u>		<u>Asia/Pacific</u>	
	<u>Rating</u>	<u>Rank</u>	<u>Rating</u>	<u>Rank</u>	<u>Rating</u>	<u>Rank</u>	<u>Rating</u>	<u>Rank</u>
AT&T	3.5	2	3.9	1	3.5	1	2.9	6
IBM	3.6	1	3.5	3	3.3	2	3.3	2
Telcos	3.1	4	3.3	4	3.3	2	3.3	2
DEC	3.1	4	3.6	2	3.3	2	3.4	1
EDS	3.1	4	(3.0)		(3.0)		2.8	7
BT	3.1	4	(2.8)		3.0	5	3.2	4
GEIS	2.0	8	3.2	5	(3.1)		3.0	5
Infonet	3.5	2	(3.0)		(3.0)		(2.6)	

Note

- Ratings are the combined ratings for network-based applications and enhanced communications services and, on a scale of 1 to 5, 1=low and 5=high. Differences of 0.4 or less are not significant.
- Ratings in parentheses are for vendors rated by under half of respondents and are not ranked.



Exhibit II-8

**ACCEPTABILITY OF OFFERING LIMITED SELECTION
OF COMMUNICATIONS SERVICES
(Percent of Respondents)**

U.S.

- | | |
|----------|------|
| • Large | 100% |
| • Medium | 86% |

Europe	95%
--------	-----

Asia/Pacific	70%
--------------	-----



III. RESEARCH FINDINGS: CONCLUSIONS

A. The Market Situation

There are two key market-related findings that emerged from the study:

- Telecommunications operations are under severe cost pressures. The net effect is that "new" spending must displace old spending; where enterprises are trying to cut outside spending anyway, this makes it even more difficult for a new service or new vendor to be added.
- As both a cause and effect of the preceding point, customers are planning relatively few new services planned in Digital's target service areas.

B. Digital's Competitive Position

The most important finding is that Digital is very well positioned in customers' minds as a supplier of communications services. One of the key challenges for Digital is to take advantage of this situation in view of the market situation.

A secondary issue is the PTTs are viewed as being relatively capable to supply a variety of value-added services. In essence, the window of opportunity that Digital felt was still open in Europe and Asia/Pacific is beginning to close earlier than expected.

C. The Changing Nature of the Telecommunications Function

In INPUT's opinion, both of the market factors identified in section "A" above are a result of the changing nature of the telecommunications function: Telecommunications is increasingly being viewed as part of an organization's infrastructure, providing a kind of "utility" service. This "cost center" mentality is such that during economic downturns, such as the one that many firms worldwide are going through, telecommunications is viewed as an area where costs can be saved or deferred.

Actually, based on research that INPUT has performed, the problem is deeper than a temporary economic downturn: More and more systems and communications initiatives are being driven by (a) overall business needs and (b) end users. As will be shown in Chapter IV, many of the future telecommunications opportunities lie outside of the classic telecommunications function.



D. Digital's Opportunity

INPUT believes that Digital has the opportunity to become a factor in supplying communications-based services because of the market's receptivity.

However, the opportunity may not lie in supplying standalone communication services in the narrower sense. The next chapter will describe two related opportunity areas and provide a preliminary contrast to narrower, more traditional telecommunications services.



IV. RELATED MARKET OPPORTUNITIES

This chapter describes two market opportunities that have a significant communications component: Systems integration and LAN service/support.

A. Description of the Opportunities

1. SYSTEMS INTEGRATION

Systems integration is an activity with varying definitions. INPUT's definition, which is widely accepted, is:

Systems integration is a business offering that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

These products and services include:

- Equipment
 - Information systems
 - Communications
- Software products
 - Systems software
 - Applications software
- Professional services
 - Consulting
 - Feasibility and tradeoff studies
 - Selection of equipment, network, and software
 - Project management
 - Design/integration
 - Systems design
 - Installation of equipment, network, and software



- Demonstration and testing
- Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
- Education/training and documentation
- Systems operations/maintenance
- Data/voice communication services
- Other miscellaneous products/services
 - Site preparation
 - Data processing supplies
 - Processing/network services

2. NETWORKED LAN SUPPORT

"Networked LAN support" is a still evolving service concept. Based on recent INPUT research and analysis, the focus of this support is LANs that are connected to other LANs or other computer systems. There are currently over 12 million PC/workstations currently connected to such environments in the U.S. along.

The range of potential services includes:

- Strategy and planning
- Design
 - Network design
 - Product evaluation, selection and/or acquisition
 - Configuration design
- Implementation
 - Connectivity to other networks
 - Custom software development
 - Multivendor integration



- Support and operations
 - Help desk and defect support
 - Problem analysis and performance management
 - Backup and recovery
 - Network operations and management
 - Education and training

B. Market Size

The worldwide systems integration market is a was a \$9 billion dollar market in 1991 (Exhibit IV-1). What is most interesting from Digital's standpoint is that in the U.S. almost one-third of this market is communications-related systems integration. (INPUT does not have detailed data for other geographies at this time, but believes the proportions are similar.)

A less visible, but very large market is that providing service/support for networked LANS. This market was over \$3 billion in 1991 in the U.S. alone (Exhibit IV-1). (INPUT believes that the current markets in Europe and Asia/Pacific are considerably smaller, but will enter a period of high growth by 1994.)

Note: INPUT cannot at this time break out the communications support component of the systems operations (outsourcing) market. However, this is obviously also a significant market.

These communications markets are growing at almost 30% annually compared to the zero growth in traditional telecommunications services (Exhibit IV-2).

Based on other research, INPUT believes that Digital would find good acceptance in the networked LAN support market.

Note: INPUT does not have current data on Digital's acceptability in providing communications-related systems integration or communications-related systems operations (outsourcing).



C. Characteristics of Related Markets

Digital should understand that these related markets have quite different characteristics from the traditional telecommunications market, even for the types of value-added services that CT is now prepared to supply. This section will summarize some of the difference from a market standpoint.

Both the systems integration and networked LAN support markets are typified by:

- Significant vertical application importance
- High end user involvement in systems decision making
- An access to ad hoc or additional funding ("new money") that is typically unavailable to telecommunications operations
- An openness to outside solutions and vendor services

Exhibit IV-4 contrasts these two opportunity areas to traditional telecommunications services.

There are additional implications to the complex of traits shown in Exhibit IV-4:

- There is much less sensitivity toward price in these newer areas; "value-added" is a real proposition.
- Systems integration and LAN projects have high-level executive visibility.
- In spite of this, the overall technical risk is generally lower in systems integration and LAN support functions.

These contrasts are shown in Exhibit IV-5.



Exhibit IV-1

CURRENT AND FUTURE MARKET SIZE

<u>Market</u>	<u>Market Size</u> <u>(\$ billion)</u>	
	<u>Current</u>	<u>Future</u>
Systems Integration		
• Total Commercial (U.S.)	\$4.4 (1991)	\$10.5 (1996)
• Communications-related (U.S.)	1.3 (1991)	3.6 (1995)
• Europe	3.4 (1991)	7.9 (1996)
• Asia/Pacific	3.2 (1991)	8.5 (1996)
Networked LAN Support (U.S.)	5.8 (1991)	10.4 (1994)

Source: INPUT Forecasts



Exhibit IV-2

ANNUAL GROWTH RATES IN SELECTED COMMUNICATIONS AREA

<u>Area</u>	<u>CAGR*</u>	<u>Time Period</u>
Traditional Telecommunications	0	1992-1995
Systems Integration	19%	1991-1996
• Total Commercial (U.S.)		
• Communications-related (U.S.)	29%	1991-1995
• Europe	19%	1991-1996
• Asia/Pacific	20%	1991-1996
Networked LAN Support (U.S.)	30%	1991-1994

Source: INPUT Studies

* CAGR = Compound Annual Growth Rate



Exhibit IV-3

**DIGITAL ACCEPTABILITY AS A VENDOR
IN COMMUNICATION SERVICE MARKETS**

<u>Market</u>	<u>Digital Acceptability</u>
Traditional Telecommunications Services	Very good
Systems Integration/ Communications-related	Unknown
Networked LAN Support	Good

Source: INPUT Research



Exhibit IV-4

**CHARACTERISTICS OF COMMUNICATION SERVICES
OPPORTUNITIES**

<u>Opportunity</u>	<u>Vertical Application Driven</u>	<u>End User Involvement</u>	<u>Access to "New Money"</u>	<u>Openness to Outside Solutions</u>
Traditional Telecommunica- tions Services	Medium to Low	Low	Low	Medium to Low
Systems Integration	Very High	High	Very High	High-(End User) Low-(IS)
Networked LAN Support	Medium (& growing)	High	Very High	High

Source: INPUT Research (U.S., Europe)



Exhibit IV-5

**INPUT ASSESSMENT OF COMMUNICATION SERVICE
OPPORTUNITIES**

<u>Opportunity</u>	<u>Price Sensitivity</u>	<u>Positive Visibility</u>	<u>Perceived Value-added</u>	<u>Technical Risk</u>
Traditional Telecommuni- cations Services	High	Low	Low to Medium	High
Systems Integration	Low	High	High	Medium to High
Networked LAN Support	Medium	High	Medium (& growing)	Medium (& growing)

Source: INPUT Assessment



V. RECOMMENDATIONS

INPUT believes that CT should examine the role that it could play in offering non-traditional telecommunication services. To do this will involve the activities outlined below.

A. Identify Additional Service Opportunities

This report went into some detail on systems integration and networked LAN support. References were made to systems operations (outsourcing). Other potential areas should be identified and analyzed.

B. Identify Additional Information on Systems Integration and Networked LAN Support

There are several voids in INPUT's current data, including:

- Communications-related systems integration market sizing outside the U.S.
- Networked LAN support outside the U.S.
- The communications support proportion of systems operations (outsourcing)

INPUT does not believe that these voids are critical for initial decision making; however, if required, INPUT would assist in developing additional sizing information.

INPUT does believe that it is important to confirm whether Digital has the same type of communications capability "halo" for providing systems integration-related services as was found for traditional communications and for networked LAN support. Such data may already be in Digital's possession.

C. Identify Service Components

This report only identified in general terms the communications-oriented service components required to support these markets and the relationship of these to other components. Again, some or all of this information may already be in the possession of Digital.



D. Match Skill Sets to Service Components

One of the key reasons for identifying service components ("C" above) is to match these with the skill sets within CT (and Digital overall) in order to assess strengths and identify areas where training or personnel is required. One example is the needed for additional resources to support professional services and consulting.

E. Review Digital Systems Integration Bids

To gain further insight into Digital-specific opportunities, Digital should review recent systems integration bidding situations (both where Digital bid and chose not to bid) to understand the following:

- The extent and importance of the communications-related component
- How Digital's capabilities in this area were assessed by the customer
- The sources of the communications resources
- Quality and profitability of the communications-related services

Note: Special attention should be paid to situations where there was an opportunity to supply an ongoing communications service as part of a systems integration project. In INPUT's experience there are considerable opportunities in connection with systems integration projects to supply short or long term applications-specific telecommunication services. This may mean "going around" the established telecommunications management and network to do so.

F. Identify Potential Partnership Situations

There are two partnership options: Internal and external.

1. INTERNAL

Internally, a partnership would presumably flow through the systems integration organization. However, it is INPUT's understanding that Digital's 25 or so professional services branches in the U.S. have great leeway in the types of arrangements that they make with other firms. It will be important to understand exactly what the business and organizational options are.

2. EXTERNAL

The scope for external arrangements is very broad, given the "halo" effect of Digital's name.

- There would be a direct, subcontracting relationship with systems integration firms that do not have the capability of supplying communications services (e.g., the Big Six except for Andersen).
- Digital could also enter into joint venture relationships with firms like GEIS or Infonet which, surprisingly, do not have the credibility of Digital.
- Since Digital is not under the same constraints as AT&T or the RBOCs, one or more joint ventures could be feasible here as well. Similar opportunities may exist with PTTs as they emerge from their cocoons.

The partnership issues are very complex and would need more investigation and analysis before proceeding.



VI. SUMMARY

The results of the market study have shown that there are probably fewer opportunities than expected in CT providing traditional communication services.

However, the market acceptability of Digital as a supplier of communications services provides Digital with an opportunity that many other firms would envy.

This reputation could provide a real advantage in entering new, fast-growing communications-related markets.



**THE BUSINESS OPPORTUNITY FOR OFFERING
CONNECTIVITY AND VALUE-ADDED SERVICES
TO THE GLOBAL MARKETPLACE**

Findings and Recommendations

Prepared for:

**DIGITAL EQUIPMENT CORP.
CORPORATE TELECOMMUNICATIONS**

June 3, 1992

INPUT

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Table 1. Mean (SD) age, height, weight, and body mass index (BMI) of the 100 children in the study

Measure	Mean (SD)
Age (years)	10.5 (0.5)
Height (cm)	148.5 (10.5)
Weight (kg)	40.5 (10.5)
BMI (kg m ⁻²)	18.5 (3.5)

children were asked to perform a series of tasks that were designed to assess their ability to perform a range of physical activities. The tasks were performed in a series of three trials, with the first trial being a practice trial.

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I. INTRODUCTION

A. Background

INPUT was engaged by Corporate Telecommunications (CT) to assess the opportunity for offering end-to-end connectivity and value-added services to the global marketplace. The range of services that could be offered to the market is shown in Exhibit I-1.

The study covers the following issues:

- The size and nature of the overall opportunity
- The geographic differences in the opportunity, i.e., between the U.S., Europe and Asia/Pacific
- Differentiating the opportunity between Levels 1b, 2 and 3 on Exhibit I-1.
- Assessing the perceptions of Digital's capabilities to offer these services as viewed by potential customers.
- The risks of entry, both market-based and regulatory.
- The organizational implications of addressing the opportunity

These initial objectives were modified somewhat, as will be described below, after the initial results of the study were reviewed with CT.

Preliminary results were presented at a CT staff meeting in Rochester, New York on April 3, 1992. As result of that meeting it was agreed to expand the survey base from global companies to include a more diverse selection of companies (see "Methodology", below). There were also several adjustments made to the questionnaire, principally to include more detail on OSI plans for companies where this was a priority.

There was a later telephone conference review on May 15, 1992 with the Digital project managers to verbally review findings. The major result of that review was agreement to include information on additional market opportunities that were outside the scope of the initial study, based on existing INPUT materials and assessments. This material is included in Chapter IV.

B. Methodology

The original methodology was aimed at interviewing 36 large international companies in the U.S., Europe and Asia/Pacific. As a result of the April 3 briefing it was agreed that the interview program should be further expanded to cover a more diverse set of companies in the U.S. and Europe to see if there were additional opportunities beyond international companies.

- Twenty additional interviews were added, as shown in Exhibit I-2.
- U.S. respondents were divided into ten multi-billion dollar companies and 14 companies that were in the \$500 million - \$1 billion class (Exhibit I-3).
- European interviews were segmented as follows:
 - European-based firms with a global focus
 - Firms with a European focus
 - Enterprises with primarily a single-country focus
 - Firms interviewed are shown in Exhibit I-4
 - Note: In subsequent analysis it turned out that the differences between European firms was generally relatively slight, consequently exact classifications became less important.
- Asia/Pacific interviews are shown in Exhibit I-5.

Respondents were well informed and able to answer virtually all questions (in a few cases certain pieces of information were held to be proprietary). The most common title was "Director" within the telecommunications function; some vice presidents and managers were interviewed as well. (Less seniors titles were more common in larger enterprises with a specialized telecommunications planning function.)

The diagram in Exhibit I-1 proved to be very effective in ensuring consistent definitions and understanding across different geographies and languages.

Interviews were conducted locally in Europe, Asia/Pacific and the U.S. All interviews were conducted by telephone, except in Japan, where face-to-face interviewing is the cultural norm. In many cases respondents received a copy of the questionnaire before the actual interview; this was quite effective as a means of collecting quantitative information; in a few cases, respondents faxed a completed questionnaire back and there was subsequently telephone follow-up.

The size of the interview samples for particular geographies tended to be on the small side and some of the numeric computations consequently have a larger margin of error than usual. However, because so many of the key findings appear unambiguous, INPUT does not believe that a larger interview panel or more face-to-face interviews would have had a material effect on the results

C. Structure of this Report

This report is intended to capture key findings and recommendations in preparation for the voice conference meeting on June 3. For this report several secondary items have been omitted to save space and readers' time, among them:

- A copy of the questionnaire used.
- Exemplary comments from respondents
- Finer analytic breakdowns that turned out not to show significant differences (e.g., intra-European differences, vendor ratings for specific capabilities)

The final report will include this material, plus other points that may be raised at the June 3 meeting.

Exhibit I-1

Levels of Communication Services

3	Network-Based Applications (Examples)	Electronic Mail (within an enterprise) Electronic Mail (between enterprises) Employee Locator (on-line) Electronic Data Interchange (EDI)								
2	Enhanced Communications Services (Examples)	OSI	TCP/IP	DEC Net	SNA	Packet Switching	Frame Relay	Bulk Data Transfer	Video	
1b	Value-added bandwidth (examples) <ul style="list-style-type: none">Expedited deliveryQuickly adjustable bandwidthDefined performance levelsCross-border service									
1a	Pure bandwidth (e.g., tariffed circuits from carriers)									

Exhibit I-2

INTERVIEW DISTRIBUTION

U.S.	24
Europe	20
Asia/Pacific	<u>12</u>
TOTAL	56

U.S. INTERVIEWS

Large Companies (\$1 billion plus)

Hughes
McDonnell Douglas
Northrop
Pepsico
Postal Service
Rockwell
Seagrams
Sears
Security Pacific
Wells Fargo

Medium-Sized Companies (\$500 million-\$1 billion)

Acustar
Alabama Power
American General Life
Baxter
Brooklyn Union
Citibank Mortgage
Commonwealth Electric
Gould Pump
InterAmerican Bank
Niagara Mohawk
Racal (U.S.)
Royal Insurance
Steelcase
University of Chicago

Exhibit I-4

EUROPEAN INTERVIEWS

Single Country Focus

British Coal

CCTA

Confederation

Lloyds

Preussag

Smiths

Societe General

Sollac

European Focus

Arjo

BOC

Ford Europe

Grand Metropolitan

ICI

Philips Petroleum (Europe)

Rank

Global Focus (European-based)

BP

Hoescht

Hoffman-LaRoche

Nestle

Shell

Exhibit I-5

ASIA-PACIFIC INTERVIEWS

BHP

BP

Cathay Pacific

Challenge Bank

Citibank (Singapore)

Hong Kong Bank

Mitsubishi Shoji

Nichirei

Nikki

Reuters (Singapore)

Thorn EMI

Westpac Bank

II. RESEARCH FINDINGS

The findings are organized into the following categories:

- Telecommunications expenditures
- Importance of data network issues
- Network-based applications opportunities
- Enhanced services opportunities
- "Value-added Bandwidth" service opportunity
- Vendor ratings

Note the terminology created in Exhibit I-1 ("network-based applications", "Enhanced Services" and "Value-added Bandwidth") has been used in this section for major categories.

A. Telecommunications Expenditures

One of the most important findings was that telecommunications budgets are expected to be flat worldwide (Exhibit II-1).

- This average is not the result of a number of high-growth companies balanced by negative growth companies. The majority of responses clustered quite close to zero. In fact, "zero" was the most common response to questions of overall growth.
- In-house personnel expenses are generally seen as growing in line with inflation, i.e., supporting a flat head count.
- Equipment and, especially, circuit expenses are seen as declining. Essentially, telecommunications departments are hoping to fund increased staff expenses with savings from outside vendors. One effect of this is for customers to place more emphasis on driving costs down from vendors rather than obtaining "improved service". This has implications for the proposed CT services that will be discussed at greater length later in this chapter.

It should be strongly noted that this flatness pertains only to "traditional" communications services which are supplied centrally. Two major exceptions to this spending pattern, systems integration services and LAN services/support, are discussed in detail in Chapter IV.

B. Importance of Data Network Issues

The relative importance of different issues that are facing communications operations has a significant impact on companies' usage of outside services. Exhibit II-2 shows the relative importance of major issues. (These issues are arranged according to the importance of the issues in large U.S. companies for purposes of comparison and contrast.)

- Reducing costs is exceptionally important in all geographies, except medium-sized U.S. companies, where it is still quite important. This finding is not at all surprising, given the direction of budgets.
- The large U.S. companies feel under pressure to make improvements across a number of areas:
 - Service quality and reliability
 - Staff skills
 - Responsiveness to both internal and external users

It is an open question, of course, how they will meet these goals in a no-growth environment.

- The other geographies have the same general priorities, but attach somewhat less importance to each issue. This probably shows both a better sense of what is practical. In addition, in some of these organizations telecommunications is relatively less important to the business. This last point is brought out clearly in the relative importance given to improving responsiveness to an enterprise's own customers:
 - Large U.S. firms attach considerable importance to this since, in many cases, these enterprises are communicating directly with customers.
 - This is less so in other geographies or for medium-sized U.S. companies.
- In general all companies showed low interest in outsourcing telecommunications functions. However, it should be noted that outsourcing interest and decisions usually take place at the general management level, as opposed to the technical management level.
- There was only modest interest generally in offering new communications services. This is consistent with the overall budget situation.

C. Network-Based Applications Opportunities

Exhibit II-3 shows the percent of respondents in each geography that are currently using specific network-based applications as well as their future plans for significant changes (either replacing a current offering or installing a new offering).

Internal E-Mail is heavily used in all geographies. Medium-sized U.S. companies are least satisfied with their current system and half are looking for replacements (or, more commonly, standardizing on one of multiple systems). This situation presents opportunities. However, opportunities appear to be for software product vendors: Virtually all current and targeted systems are software-based, resident on the customer's own network. The interest in a service based on a vendor's network is very small.

External E-mail systems currently in use (often integrated with the internal E-mail system) range from 80% penetration in large U.S. companies to 8% in Asia/Pacific. Future plans are more modest than for internal systems and, again, are almost all software based.

The penetration of employee locator systems is, broadly speaking similar to external E-mail, but at a lower level of intensity.

- The employee locator is also often integrated with the E-mail system.
- Similarly, these are all software-driven (and not provided as a service)
- Most importantly, there are few plans for additional changes.

EDI is fairly widely used, except in Asia/Pacific. Much of this function is executed in a service environment.

- However, there are relatively few plans for significant changes; most of the activities involve expanding the use of current systems and improving the underlying applications.
- This finding is consistent with INPUT's other information on the EDI market which comes from INPUT's subscription program in EDI.

D. Enhanced Services Opportunities

Exhibit II-4 summarizes the importance of enhanced services across geographies. These are arranged in the order of importance for large U.S. companies, which is also roughly the order overall, especially for the top half of the list.

- Obviously, SNA is of some importance to all companies, especially the largest companies with an SNA "tradition".
- TCP/IP is also relatively important. However, it should be pointed out that a ratings ranging from 3.1 to 3.6 are not especially impressive.
- There is some interest in OSI-based networks. It may be recalled that because of the high relative showing of OSI in the early interviews that it was agreed that more probes would be added to the enterprises that rated OSI relatively high. The results do not indicate very much current market activity:
 - Relatively few firms had implemented or were implementing OSI networks now; a few were engaged in testing, but it did not appear to be a high priority item.
 - Most firms that showed an interest were speaking in terms of potential future importance: Where timing was given (or known), milestones were usually several years in the future.

There are some additional differences in need by geography:

- Medium-sized U.S. firms place somewhat higher importance on OSI networks; however, all the caveats in the preceding paragraph apply to these firms also.
- The medium-sized U.S. firms place more importance on frame relay than any other group.
- Asia/Pacific, on the other hand places more importance on packet switching. These differences may relate to the relative maturity of the two geographic markets.
- The intensity of needs in Europe in general appear to be somewhat less than the other geographies.

In general, where enterprises are planning change and expansion, their plans assume utilizing the network (or networks) currently developed and under their control. There was a widespread feeling among respondents that current networks represented investments (or "sunk costs") that should be leveraged in applying new services or functionality. INPUT believes that this kind of thinking is responsible for network service providers such as Infonet or GEIS being somewhat less visible as service providers (see "F" below for more detail).

E. "Value-Added Bandwidth" Service Opportunity

A substantial minority of respondents in each geography say they are utilizing these services now (Exhibit II-5). The services provided fall into two general categories:

- Companies (generally larger companies) that have reached a critical mass in size and expertise are able to make special arrangements with carriers and/or manage their own networks in this fashion.
- Companies, especially overseas, view improvements in service or terms by Telcos/PTTs as falling into this category. This does not represent special treatment for a company, but an overall improvement in service levels, in excess of previous customer expectations.

In Europe and Asia/Pacific a quarter of respondents were considering such a service. However, this generally took the form of "We'll certainly consider any offering such as that". There was no indication that much, if any, higher price would be paid for such services beyond what they would pay a carrier themselves.

F. Vendor Ratings

One of the most important aspects of the study was to learn how Digital would be viewed as a vendor in this market. There are two considerations:

- How visible is Digital as a vendor or potential vendor? That is, if only a few potential customers viewed Digital as a serious entry, it would matter far less that Digital was rated highly by those who did have an opinion.
- Once the visibility hurdle has been surmounted, the question is: How capable is Digital viewed?

The answers to both questions are quite positive:

- Digital has good to excellent "visibility" in every geography (see Exhibit II-6, which is arranged in the order of visibility in large U.S. companies). Very little separates Digital from the leading company in each geography -- in fact, Digital is the leading company in Asia/Pacific. While respondents were not asked why they felt able to rate Digital, INPUT believes the following factors are involved:

- In the U.S., Digital has benefited from a few very visible outsourcing contracts.
- There is a tendency to give large, technology-oriented companies "the benefit of the doubt" in this kind of situation.
- Digital is well-known for its networking efforts and perhaps its recent communications-oriented positioning has borne fruit.
- Somewhat more surprising is the generally good marks that Digital receives for actually being capable of supplying such services (Exhibit II-7). Except in large U.S. companies, Digital actually rates first or second in each geography.
 - These ratings are even more impressive since Digital has not been offering these services on a standalone basis.
 - Obviously, the same kind of "halo" effects described in the previous paragraph are operating here as well.
 - It seems ironic that Digital rates higher than GEIS or Infonet as they have been offering some of these services for quite some time.
- Note also that PTTs in Europe and Asia/Pacific receive equivalent ratings to U.S. RBOCs. The verbal comments of respondents indicate the PTTs as a group are trying much harder to deliver services and are viewed as increasingly responsive.

Finally, it is not necessary for Digital to offer a full set of telecommunications services, i.e., be a sort of telephone company. Except for Asia/Pacific, a very large majority of respondents were willing to pick and choose services and deal with multiple vendors to get the services and benefits that they needed (Exhibit II-8).

Exhibit II-1

EXPECTED TELECOMM BUDGET GROWTH

<u>Geography</u>	<u>Range</u>	<u>Median</u>
US - Large	-25% to 15%	0
US - Medium	-20% to 100%	0
Europe	-20% to 16%	0
A/P	-10% to 50%	-2%

Exhibit II-2

IMPORTANCE OF DATA NETWORK ISSUES
IN EACH GEOGRAPHY

Change	Importance*			
	U.S.		Europe	A/P
	Large	Medium		
Reduce costs	4.8	3.9	4.4	4.1
Improve service quality	4.2	3.8	3.5	3.8
Improve service reliability	4.2	3.4	3.6	3.8
Improve staff skills	3.9	4.4	3.2	3.6
Improve responsiveness to internal users	3.8	3.1	2.7	3.0
Improve responsiveness to customers	3.8	3.4	3.4	3.7
Reduce head count	3.0	2.1	3.0	3.0
Offer new communications service	2.5	2.7	3.1	3.1
Outsource services or functions	1.7	2.1	2.8	2.1

Note: Differences of 0.4 or less are not significant.

* 1 = low 5 = high

Exhibit II-3

NETWORK-BASED APPLICATIONS BY GEOGRAPHY

(% of Respondents)

		<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
		<u>Large</u>	<u>Medium</u>		
E-mail (Internal)					
•	Currently in use	80%	100%	75%	83%
•	Significant changes planned	30%	50%	10%	10%
E-mail (External)					
•	Currently in use	80%	50%	25%	8%
•	Significant changes planned	30%	21%	--	--
Employee locator					
•	Currently in use	60%	29%	10%	8%
•	Significant changes planned	10%	--	--	--
EDI					
•	Currently in use	50%	57%	60%	17%
•	Significant changes planned	--	21%	10%	--

Exhibit II-4

IMPORTANCE OF ENHANCED SERVICES IN EACH GEOGRAPHY

<u>Service</u>	<u>Importance*</u>			
	<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
	<u>Large</u>	<u>Medium</u>		
SNA	3.8	3.2	3.3	3.6
TCP/IP network	3.5	3.6	3.3	3.1
OSI-based network	3.0	3.4	2.8	2.6
DECNet	3.0	2.9	2.7	2.9
Video	3.2	3.3	2.3	2.3
Bulk data transfer	3.0	3.0	2.4	2.8
Frame Relay	2.5	3.6	2.3	3.0
Packet Switching	2.4	2.5	3.1	3.6

Note: Differences of 0.4 or less are not significant.

* 1 = low 5 = high

Exhibit II-5

USE OF "VALUE-ADDED BANDWIDTH" SERVICES

	<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
	<u>Large</u>	<u>Medium</u>		
Using "Value-added Bandwidth" Now	30%	29%	42%	25%
Not using, but considering	10%	---	25%	25%

Exhibit II-6

**"VISIBILITY" OF POTENTIAL COMMUNICATION
SERVICES VENDORS
(% of Respondents Able to Rate)**

<u>Vendor</u>	<u>U.S.</u>		<u>Europe</u>	<u>A/P</u>
	<u>Large</u>	<u>Medium</u>		
AT&T	90%	93%	60%	92%
IBM	90%	93%	65%	92%
Telcos*	90%	86%	55%	83%
DEC	80%	79%	55%	100%
EDS	80%	43%	10%	50%
BT	60%	43%	75%	92%
GEIS	50%	50%	40%	75%
Infonet	50%	10%	35%	42%

*RBOC(s) in U.S.; PTT(s) elsewhere

Exhibit II-7

RATINGS OF COMMUNICATION SERVICES VENDORS

	U.S.							
	Large		Medium		Europe		Asia/Pacific	
	Rating	Rank	Rating	Rank	Rating	Rank	Rating	Rank
AT&T	3.5	2	3.9	1	3.5	1	2.9	6
IBM	3.6	1	3.5	3	3.3	2	3.3	2
Telcos	3.1	4	3.3	4	3.3	2	3.3	2
DEC	3.1	4	3.6	2	3.3	2	3.4	1
EDS	3.1	4	(3.0)		(3.0)		2.8	7
BT	3.1	4	(2.8)		3.0	5	3.2	4
GEIS	2.0	8	3.2	5	(3.1)		3.0	5
Infonet	3.5	2	(3.0)		(3.0)		(2.6)	

Note

- Ratings are the combined ratings for network-based applications and enhanced communications services and, on a scale of 1 to 5, 1=low and 5=high. Differences of 0.4 or less are not significant.
- Ratings in parentheses are for vendors rated by under half of respondents and are not ranked.

Exhibit II-8

**ACCEPTABILITY OF OFFERING LIMITED SELECTION
OF COMMUNICATIONS SERVICES
(Percent of Respondents)**

U.S.

• Large	100%
• Medium	86%

Europe **95%**

Asia/Pacific **70%**

III. RESEARCH FINDINGS: CONCLUSIONS

A. The Market Situation

There are two key market-related findings that emerged from the study:

- Telecommunications operations are under severe cost pressures. The net effect is that "new" spending must displace old spending; where enterprises are trying to cut outside spending anyway, this makes it even more difficult for a new service or new vendor to be added.
- As both a cause and effect of the preceding point, customers are planning relatively few new services planned in Digital's target service areas.

B. Digital's Competitive Position

The most important finding is that Digital is very well positioned in customers' minds as a supplier of communications services. One of the key challenges for Digital is to take advantage of this situation in view of the market situation.

A secondary issue is the PTTs are viewed as being relatively capable to supply a variety of value-added services. In essence, the window of opportunity that Digital felt was still open in Europe and Asia/Pacific is beginning to close earlier than expected.

C. The Changing Nature of the Telecommunications Function

In INPUT's opinion, both of the market factors identified in section "A" above are a result of the changing nature of the telecommunications function: Telecommunications is increasingly being viewed as part of an organization's infrastructure, providing a kind of "utility" service. This "cost center" mentality is such that during economic downturns, such as the one that many firms worldwide are going through, telecommunications is viewed as an area where costs can be saved or deferred.

Actually, based on research that INPUT has performed, the problem is deeper than a temporary economic downturn: More and more systems and communications initiatives are being driven by (a) overall business needs and (b) end users. As will be shown in Chapter IV, many of the future telecommunications opportunities lie outside of the classic telecommunications function.

D. Digital's Opportunity

INPUT believes that Digital has the opportunity to become a factor in supplying communications-based services because of the market's receptivity.

However, the opportunity may not lie in supplying standalone communication services in the narrower sense. The next chapter will describe two related opportunity areas and provide a preliminary contrast to narrower, more traditional telecommunications services.

IV. RELATED MARKET OPPORTUNITIES

This chapter describes two market opportunities that have a significant communications component: Systems integration and LAN service/support.

A. Description of the Opportunities

1. SYSTEMS INTEGRATION

Systems integration is an activity with varying definitions. INPUT's definition, which is widely accepted, is:

Systems integration is a business offering that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

These products and services include:

- Equipment
 - Information systems
 - Communications
- Software products
 - Systems software
 - Applications software
- Professional services
 - Consulting
 - Feasibility and tradeoff studies
 - Selection of equipment, network, and software
 - Project management
 - Design/integration
 - Systems design
 - Installation of equipment, network, and software

- Demonstration and testing
- Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
- Education/training and documentation
- Systems operations/maintenance
- Data/voice communication services
- Other miscellaneous products/services
 - Site preparation
 - Data processing supplies
 - Processing/network services

2. NETWORKED LAN SUPPORT

"Networked LAN support" is a still evolving service concept. Based on recent INPUT research and analysis, the focus of this support is LANs that are connected to other LANs or other computer systems. There are currently over 12 million PC/workstations currently connected to such environments in the U.S. along.

The range of potential services includes:

- Strategy and planning
- Design
 - Network design
 - Product evaluation, selection and/or acquisition
 - Configuration design
- Implementation
 - Connectivity to other networks
 - Custom software development
 - Multivendor integration

- Support and operations
 - Help desk and defect support
 - Problem analysis and performance management
 - Backup and recovery
 - Network operations and management
 - Education and training

B. Market Size

The worldwide systems integration market is a was a \$9 billion dollar market in 1991 (Exhibit IV-1). What is most interesting from Digital's standpoint is that in the U.S. almost one-third of this market is communications-related systems integration. (INPUT does not have detailed data for other geographies at this time, but believes the proportions are similar.) -

A less visible, but very large market is that providing service/support for networked LANS. This market was over \$3 billion in 1991 in the U.S. alone (Exhibit IV-1). (INPUT believes that the current markets in Europe and Asia/Pacific are considerably smaller, but will enter a period of high growth by 1994.)

Note: INPUT cannot at this time break out the communications support component of the systems operations (outsourcing) market. However, this is obviously also a significant market.

These communications markets are growing at almost 30% annually compared to the zero growth in traditional telecommunications services (Exhibit IV-2).

Based on other research, INPUT believes that Digital would find good acceptance in the networked LAN support market.

Note: INPUT does not have current data on Digital's acceptability in providing communications-related systems integration or communications-related systems operations (outsourcing).

C. Characteristics of Related Markets

Digital should understand that these related markets have quite different characteristics from the traditional telecommunications market, even for the types of value-added services that CT is now prepared to supply. This section will summarize some of the difference from a market standpoint.

Both the systems integration and networked LAN support markets are typified by:

- Significant vertical application importance
- High end user involvement in systems decision making
- An access to ad hoc or additional funding ("new money") that is typically unavailable to telecommunications operations
- An openness to outside solutions and vendor services

Exhibit IV-4 contrasts these two opportunity areas to traditional telecommunications services.

There are additional implications to the complex of traits shown in Exhibit IV-4:

- There is much less sensitivity toward price in these newer areas; "value-added" is a real proposition.
- Systems integration and LAN projects have high-level executive visibility.
- In spite of this, the overall technical risk is generally lower in systems integration and LAN support functions.

These contrasts are shown in Exhibit IV-5.

Exhibit IV-1

CURRENT AND FUTURE MARKET SIZE

<u>Market</u>	<u>Market Size</u> <u>(\$ billion)</u>	
	<u>Current</u>	<u>Future</u>
Systems Integration		
• Total Commercial (U.S.)	\$4.4 (1991)	\$10.5 (1996)
• Communications-related (U.S.)	1.3 (1991)	3.6 (1995)
• Europe	3.4 (1991)	7.9 (1996)
• Asia/Pacific	3.2 (1991)	8.5 (1996)
Networked LAN Support (U.S.)	5.8 (1991)	10.4 (1994)

Source: INPUT Forecasts

Exhibit IV-2

ANNUAL GROWTH RATES IN SELECTED COMMUNICATIONS AREA

<u>Area</u>	<u>CAGR*</u>	<u>Time Period</u>
Traditional Telecommunications	0	1992-1995
Systems Integration	19%	1991-1996
• Total Commercial (U.S.)		
• Communications-related (U.S.)	29%	1991-1995
• Europe	19%	1991-1996
• Asia/Pacific	20%	1991-1996
Networked LAN Support (U.S.)	30%	1991-1994

Source: INPUT Studies

* CAGR = Compound Annual Growth Rate

Exhibit IV-3

**DIGITAL ACCEPTABILITY AS A VENDOR
IN COMMUNICATION SERVICE MARKETS**

<u>Market</u>	<u>Digital Acceptability</u>
Traditional Telecommunications Services	Very good
Systems Integration/ Communications-related	Unknown
Networked LAN Support	Good

Source: INPUT Research

Exhibit IV-4

CHARACTERISTICS OF COMMUNICATION SERVICES
OPPORTUNITIES

<u>Opportunity</u>	<u>Vertical Application Driven</u>	<u>End User Involvement</u>	<u>Access to "New Money"</u>	<u>Openness to Outside Solutions</u>
Traditional Telecommunica- tions Services	Medium to Low	Low	Low	Medium to Low
Systems Integration	Very High	High	Very High	High-(End User) Low-(IS)
Networked LAN Support	Medium (& growing)	High	Very High	High

Source: INPUT Research (U.S., Europe)

Exhibit IV-5

**INPUT ASSESSMENT OF COMMUNICATION SERVICE
OPPORTUNITIES**

<u>Opportunity</u>	<u>Price Sensitivity</u>	<u>Positive Visibility</u>	<u>Perceived Value-added</u>	<u>Technical Risk</u>
Traditional Telecommuni- cations Services	High	Low	Low to Medium	High
Systems Integration	Low	High	High	Medium to High
Networked LAN Support	Medium	High	Medium (& growing)	Medium (& growing)

Source: INPUT Assessment

V. RECOMMENDATIONS

INPUT believes that CT should examine the role that it could play in offering non-traditional telecommunication services. To do this will involve the activities outlined below.

A. Identify Additional Service Opportunities

This report went into some detail on systems integration and networked LAN support. References were made to systems operations (outsourcing). Other potential areas should be identified and analyzed.

B. Identify Additional Information on Systems Integration and Networked LAN Support

There are several voids in INPUT's current data, including:

- Communications-related systems integration market sizing outside the U.S.
- Networked LAN support outside the U.S.
- The communications support proportion of systems operations (outsourcing)

INPUT does not believe that these voids are critical for initial decision making; however, if required, INPUT would assist in developing additional sizing information.

INPUT does believe that it is important to confirm whether Digital has the same type of communications capability "halo" for providing systems integration-related services as was found for traditional communications and for networked LAN support. Such data may already be in Digital's possession.

C. Identify Service Components

This report only identified in general terms the communications-oriented service components required to support these markets and the relationship of these to other components. Again, some or all of this information may already be in the possession of Digital.

D. Match Skill Sets to Service Components

One of the key reasons for identifying service components ("C" above) is to match these with the skill sets within CT (and Digital overall) in order to assess strengths and identify areas where training or personnel is required. One example is the needed for additional resources to support professional services and consulting.

E. Review Digital Systems Integration Bids

To gain further insight into Digital-specific opportunities, Digital should review recent systems integration bidding situations (both where Digital bid and chose not to bid) to understand the following:

- The extent and importance of the communications-related component
- How Digital's capabilities in this area were assessed by the customer
- The sources of the communications resources
- Quality and profitability of the communications-related services

Note: Special attention should be paid to situations where there was an opportunity to supply an ongoing communications service as part of a systems integration project. In INPUT's experience there are considerable opportunities in connection with systems integration projects to supply short or long term applications-specific telecommunication services. This may mean "going around" the established telecommunications management and network to do so.

F. Identify Potential Partnership Situations

There are two partnership options: Internal and external.

1. INTERNAL

Internally, a partnership would presumably flow through the systems integration organization. However, it is INPUT's understanding that Digital's 25 or so professional services branches in the U.S. have great leeway in the types of arrangements that they make with other firms. It will be important to understand exactly what the business and organizational options are.

2. EXTERNAL

The scope for external arrangements is very broad, given the "halo" effect of Digital's name.

- There would be a direct, subcontracting relationship with systems integration firms that do not have the capability of supplying communications services (e.g., the Big Six except for Andersen).
- Digital could also enter into joint venture relationships with firms like GEIS or Infonet which, surprisingly, do not have the credibility of Digital.
- Since Digital is not under the same constraints as AT&T or the RBOCs, one or more joint ventures could be feasible here as well. Similar opportunities may exist with PTTs as they emerge from their cocoons.

The partnership issues are very complex and would need more investigation and analysis before proceeding.

VI. SUMMARY

The results of the market study have shown that there are probably fewer opportunities than expected in CT providing traditional communication services.

However, the market acceptability of Digital as a supplier of communications services provides Digital with an opportunity that many other firms would envy.

This reputation could provide a real advantage in entering new, fast-growing communications-related markets.

About INPUT

INPUT is a worldwide consulting and market research firm uniquely focused on the information technology services and software markets. Executives in many technically advanced companies in North America, Europe, and Japan, rely on INPUT for data, objective analysis, and insightful opinions to support their business plans, market assessments, and technology directions. By leveraging INPUT's considerable knowledge and expertise, clients make informed decisions more quickly, and benefit by saving on the cost of internal research.

Since 1974, INPUT has compiled the most extensive research base available on the worldwide information services market and its key segments, providing detailed market forecasts, vertical industry sector analysis and forecasts and analysis of vendor strategies and products. INPUT delivers specific expertise in the fast changing areas of outsourcing, systems integration, EDI/electronic commerce, software development/CASE, and the impact of downsizing.

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Vienna, VA 22182
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Tel. (1) 46 47 65 65 Fax (1) 46 47 69 50

Frankfurt - INPUT LTD.

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Tel. 0 6447-7229 Fax 0 6447-7327

Tokyo - INPUT KK

Saida Building, 4-6
Kanda Sakuma-cho, Chiyoda-ku
Tokyo 101, Japan
Tel. (03) 3864-0531 Fax (03) 3864-4114

**THE BUSINESS OPPORTUNITY FOR OFFERING
CONNECTIVITY AND VALUE-ADDED SERVICES
TO THE GLOBAL MARKETPLACE**

Interim Findings

Presented to:

**DIGITAL EQUIPMENT CORP.
CORPORATE TELECOMMUNICATIONS**

Comput Services, Inc
16 yrs
Global

April 3, 1992

May 15

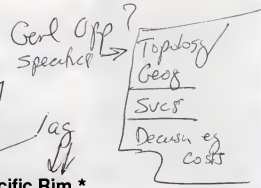


AGENDA

- **Scope of Study**
- **Approach**
- **Preliminary Report**
- **Next Steps**



SCOPE OF PROJECT



- Size and nature of opportunity
- Differentiated by U.S., Europe, Pacific Rim *

• Differentiation by three levels → explain

- Potential customers' perceptions of Digital (as offerer of connecting + value-added svcs)
- Risks *
- Organizational implications *

plus others ←

dependent on first set of findings {

* Not included in interim findings



APPROACH

met to end

- Primary research (interviews) → describe
- \$'bill +
- Major corporations in U.S., Europe, Pacific Rim (12 targeted in each geographic area) → examples
- Digital not identified as client
- Interviews began week of March 9 ≈ 2¹/₂ wks of research

gave us
some - we
added others
of same type

Ben



Questionnaire

INTERNATIONAL COMMUNICATIONS STUDY: TOPICS SUMMARY

Qual & Quant

ENVIRONMENT

1. Major characteristics of voice/data network(s)

Nodes

Protocols, standards

2. ^{data comm} 1992 costs and percentage change

In-house personnel

Circuits/transmission costs

Equipment

Facilities

External services vendors

Overhead

Total

^{then} General trends in communications costs 1992-1994

3. *opp-func* New applications/functions planned for data network in next three years

4. *opp-qual* Performance standards established/planned. Changes.

5. Strong points of existing data network. Improvements planned.
Barriers to improvement. *(weakness)*

6. Importance of changes to data network. Types of changes:

Reduce costs

Reduce head count

Improve staff skills

Improve service reliability

Improve responsiveness to internal users

Improve responsiveness to customers

Offer new communications service

Outsource services or functions

how imp rated



EXHIBIT-1

1 p/c 2
1000 words

Levels of Communication Services

3	Network-Based Applications (Examples)	<div>Electronic Mail (within an enterprise)</div> <div>Electronic Mail (between enterprises)</div> <div>Employee Locator (on-line)</div> <div>Electronic Data Interchange (EDI)</div>							
2	Enhanced Communications Services (Examples)	OSI	TCP/IP	DEC Net	SNA	Packet Switching	Frame Relay	Bulk Data Transfer	Video
1b	<div>Value-added bandwidth (examples) <i>(made it up)</i></div> <div> <ul style="list-style-type: none"> Expedited delivery Defined performance levels </div> <div> <ul style="list-style-type: none"> Quickly adjustable bandwidth Cross-border service </div> <div><i>Speed</i></div> <div><i>Flex</i></div>								
1a	Pure bandwidth (e.g., tariffed circuits from carriers)								

YNDC2

232



LEVELS OF COMMUNICATIONS SERVICES

7. Current use of "Network-based Applications". Size/cost. Supplier. Satisfaction. Plans.
8. Importance of "Enhanced Services"

scale

- OSI-based network
- TCP/IP network
- DECNet
- SNA
- Packet switching
- Frame relay
- Bulk data transfer
- Video

9. Current use of "Value-added bandwidth" services

Now using: Type. Source. Trade-offs.

Considering using: Type. Source. Trade-offs

Not using/considering: Under what conditions would use be considered? Trade-offs.

10. Must a vendor offer all three levels of services to be considered viable?
11. Amount of knowledge of specific vendors in each of three areas (in exhibit). Rating of capabilities.

AT&T
British Telecom
Digital Equipment (DEC)
EDS
GE Information Services (GEIS)
IBM
Infonet
Regional U.S. Telcos (as a group)
National telecomm carrier [by non-U.S. respondents]

12 "Advice"

Summary

part 5 contract

USO ETC



U.S. RESPONDENTS

Alabama Power

Hughes

Northrop

Pepsico

Postal Service

Rockwell

Seagrams

Sears

Security Pacific



EUROPEAN RESPONDENTS

Arjo-wiggins

BP

Confederation Life

Ford Europe

Phillips Petroleum (Europe)

Philips Electronics

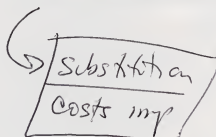


RESPONDENT PROFILE

- Telecomm management
- Responsive to virtually all questions
(a few were proprietary)
- Median data communication expenditures:
approximately \$100 million (budgets complex)

- Growth: flat or down

(vs LAN-related
25% CAGR)





APPLICATIONS (U.S.)

- **Internal E-mail**
 - **Most firms have it**
 - **Variety of suppliers (IBM, DEC, Microsoft)**
 - **Satisfaction: medium (fair to very good)**
- **External E-mail**
 - **About half have it**
 - **IBM principal vendor (PROFS)**
 - **Lower satisfaction**
- **Employee Locator**
 - **About half have it**
 - **Satisfaction: good**
- **EDI**
 - **About half have it**
 - **Satisfaction: good to excellent**
- **Few significant expansions planned**



APPLICATIONS (EUROPE)

- **Lower intensity than U.S.**
 - **Internal E-mail and EDI**
 - **Mixed satisfaction**
- **No significant plans**



"VALUE-ADDED BANDWIDTH"

U.S.

- **Three using it now**
 - **Sprint**
 - **In-house (2)** *As-it-yourself*
- **One considering**
- **Others not active**

Europe

- **Lower level of activity**



**ACCEPTABILITY OF LIMITED OFFERINGS
ACROSS "THREE LAYERS" (U.S. AND EUROPE)**

- **Acceptable to all respondents**
- **Used to dealing with multiple vendors**
- **"We will use a vendor who offers what we need."**

representative



*Small sample -
"fragile"*

CUSTOMER KNOWLEDGE OF VENDOR OFFERINGS AND RATING OF CAPABILITIES (U.S.)

<u>Vendor</u>	<u>Applications</u>		<u>Enhanced Services</u>		<u>Value-Added Bandwidth</u>	
	<u>Knowledge</u>	<u>Capabilities</u>	<u>Knowledge</u>	<u>Capabilities</u>	<u>Knowledge</u>	<u>Capabilities</u>
Digital	<u>3.6</u>	<i>- confidence - open-minded</i> <u>3.3</u>	<u>3.4</u>	<u>3.4</u>	2.4	<i>Lack of knowledge</i> 2.7
AT&T	<u>3.4</u>	<u>3.8</u>	<u>3.4</u>	<u>3.7</u>	2.8	2.7
BT	2.2	2.8	2.1	<u>3.3</u>	1.9	<u>3.0</u>
EDS	2.7	2.7	2.4	3.2	1.8	2.8
GEIS	1.9	2.0	1.8	3.0	1.8	2.7
IBM	<u>3.7</u>	<u>3.8</u>	<u>3.4</u>	<u>3.7</u>	3.2	2.7
Infonet	2.1	<u>3.5</u>	2.1	<u>3.3</u>	1.8	<u>3.0</u>
RBOCs*	<u>3.3</u>	<u>3.3</u>	<u>3.8</u>	<u>3.4</u>	<u>3.3</u>	<u>3.4</u>

0.5

* Rated as a group

1 = low 5 = high



**CUSTOMER KNOWLEDGE OF VENDOR OFFERINGS AND
RATING OF CAPABILITIES (EUROPE)**

- **Level of knowledge of U.S.-based vendors: low**
- **U.S. "names" given credit for capabilities
(AT&T, DEC, IBM)**
- **BT capabilities generally good**



ADVICE TO PROSPECTIVE VENDOR (U.S.)

- **"Don't, market is glutted"**
- **"Low cost and customer service"**
- **"Check with user, find out what they need"**
- **"Be aware of customers' needs and expense limits"**
- **"There are different needs here in _____."**
- **"Talk to customers first!"**
- **"Visit the customers."**



ADVICE TO PROSPECTIVE VENDOR (EUROPE)

- **"First, must offer functionality and quality, at a good price"**
- **"Market may be in smaller companies"
(who are not self-sufficient)"**
- **"Understand what's being offered and make sure they can do better"**
- **"Can't buy in on price alone"**
- **"Flexible pricing of products and services and no bundling"**



PRELIMINARY FINDINGS

- Cost and service critical
- OSI: growing importance in U.S.
- Digital has a good reputation, especially for an unknown
- "Cherry-picking" acceptable



INPUT

CONFIDENTIAL—Property of INPUT

CONTACT REPORT

INPUT

Staff: Init. TUR Init. _____

☐ INPUT office ☐ Client Office ☐ Other Ref

Contact Date: 10/28/92

Date Written: 1 / 1

Company <u>DBZ</u>	DISTRIBUTION:			Prog./Proj. ID _____
Name <u>Dave Cedrone</u>	Action	Info.	By When	Describe Action-F/U
Title _____				
Address _____				
Phone: () _____				
Fax: () _____				

Called to ask: Can we tell DBZ where it is
in relation to Point 12 discount
(i.e., what is range - where are they?)

JP - Sam Weinstein 703-255-7104 no answer
VM 10/29 to Cedrone J 10/26

[Alex Graham 415-358-2826]

☐ Continued over

Mail List Change Order 1. ☐ Update ☐ Correction ☐ Deletion ☐ Addition* Serial Number _____

2. Customer Type: ☐ Vendor ☐ Others ☐ Media ☐ User

3. Newsletters: ☐ EDI ☐ Field Service ☐ Other

4. Vendor: Vendor Type—☐ Client ☐ Former/Report Client ☐ Prospect

- Contact Level—☐ Executive ☐ Acquisition ☐ International ☐ Other
- If Exec. or Other Contact Level—☐ Maintenance ☐ Equipment ☐ Communications ☐ Others ☐ Info. Svc.
- If Info. Services—☐ Turnkey & Software ☐ Network & Processing ☐ Systems Integration ☐ Professional Svc.

5. If User: User Type—☐ Client ☐ Former/Report Client ☐ Prospect

- Comm. Contact Level—☐ Executive ☐ IS Mgmt. ☐ Other
- Fed. Contact Level—☐ Executive ☐ Acquisition ☐ Prog. ☐ Manager/Technical ☐ Other
- If Fed. Executive—☐ Info. Resource Mgr. ☐ Asst. Secretary ☐ Commander (Military) ☐ Agency Head
- If Fed. Other—☐ Laboratory ☐ NIS ☐ Users ☐ GSA

* No names will be added without a completed change order and program manager approval.

Program Manager Authorization

CONTACT REPORT

Continuation

Company

Name

**** Computer Select, October 1992 : Titles ****

1. Resellers say AT&T is still withholding Tariff 12 deals.
[Network World: June 8 1992]
2. FTS 2000 pricing falls under new scrutiny. (AT&T and US Sprint's government telecommunications network) [Telecommunications: June 1992]
3. Tariff 12 ruling will help some users but irk others; issue of changing 800 numbers a major hurdle... [Network World: April 27 1992]
4. FCC does about-face, opts to allow Tariff 12 changes. (U.S. Federal Communications Commission)
[Network World: April 20 1992]
5. MCI study examines FTS 2000 pricing; says government is paying more under the federal contract than it... [Network World: April 20 1992]
6. *MCI study blasts FTS prices. (MCI Communications Corp cites over-charging for FTS... [Government Computer News: April 13 1992]
7. *Roundup; stories carried by other media this week.
[Newsbytes: March 27 1992]
8. Relief may be near for AT&T Tariff 12 customers. (telephone deregulation)
[CommunicationsWeek: March 23 1992]
9. Bells, GTE doubtful they can meet 800-number portability deadline. (Federal Communications Commission... [Network World: March 9 1992]
10. AT&T digs in on Tariff 12 revision issue with FCC. (Federal Communications Commission)
[Network World: March 2 1992]
11. AT&T files more-flexible tariffs. (first service tariffs under the Federal Communications... [CommunicationsWeek: Feb 17 1992]
12. *Regulatory costs; regulatory delays cost AT&T \$100 million in 1991. (a letter to the Federal... [EDGE, on & about AT&T: Feb 17 1992]
13. Resellers charge AT&T with Option 58 discrimination; several file complaints with FCC over tariff issue... [Network World: Feb 10 1992]
14. AT&T asks to block Tariff 12 Option 58. (motives questioned)
[Network World: Feb 3 1992]
15. Users angry with Tariff 12 policy. (Federal Communications Commission refuses to allow AT&T to make... [CommunicationsWeek: Jan 27 1992]
16. Users join AT&T in pressuring FCC to accept Tariff 12 changes; customers flood commission with mail... [Network World: Jan 27 1992]
17. FCC drops the ball on three proposed Tariff 12 changes. (procedural errors)
[Network World: Jan 13 1992]
18. WorldCom restructures to increase its profitability. (World Communications Inc.)
[Network World: Jan 13 1992]
19. FCC moves worry users of Tariff 12. (United States Federal Communications Commission) (government... [Network World: Dec 30 1991]



20. FCC squelches revision of two of AT&T Tariff 12s; action heightens fears among other AT&T users. (Federal... [Network World: Dec 23 1991])
21. Tariff 12 bills much improved, users say; but AT&T is still struggling to rectify some issues like long... [Network World: Dec 23 1991]
22. FCC extends '800' cutoff. (Federal Communications Commission extends implementation date for new Tariff... [CommunicationsWeek: Dec 2 1991])
23. AT&T asks FCC to overturn ruling on Tariff 12 bundling. (the US Federal Communications Commission's... [Network World: Dec 2 1991])
24. AT&T's Allen lashes out at the regulatory process, FCC; carrier exec says regulatory restraints are failing... [Network World: Dec 2 1991]
25. Users benefit from strategic public telecom services. (Telecommunications Issues) (Column) [Network World: Dec 2 1991]
26. GAO FTS 2000 report ignites Hill debate on its accuracy. (the accuracy of a report by the US General... [Federal Computer Week: Nov 4 1991])
27. FCC has rocky road ahead in streamlining AT&T rules. (U.S. Federal Communications Commission, Regulatory... [Network World: Nov 4 1991])
28. Heat is off most Tariff 12 users. (FCC reaffirms Tariff 12 legality) [CommunicationsWeek: Oct 28 1991]
29. *Horton wallops GAO for FTS 2000 study. (US Congressman Frank Horton criticizes a General... [Government Computer News: Oct 28 1991])
30. FCC establishes legality of Tariff 12 for second time. (Federal Communications Commission) [Network World: Oct 28 1991]
31. Gov't officials: FTS 2000 too costly, service poor. (Federal Telecommunications System 2000) [Network World: Oct 28 1991]
32. AT&T warns of user harm if FCC disallows Tariff 12s. (Federal Communications Commission) (FCC... [CommunicationsWeek: Oct 7 1991])
33. Outsourcing unlikely to offer big savings. (Howard Frank, an independent consultant, warns that... [Network World: Oct 7 1991])



***** Computer Select, October 1992 : Doc #18585 *****

Journal: Network World June 8 1992 v8 n23 023(2).

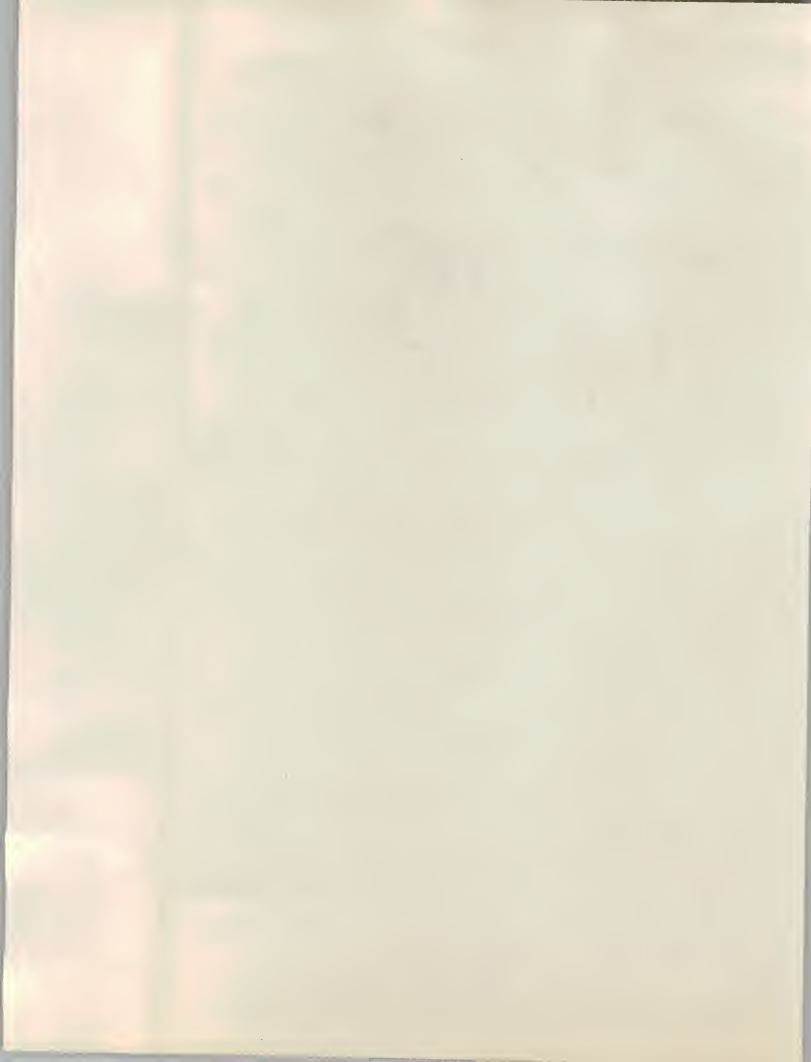
Title: Resellers say AT&T is still withholding Tariff 12 deals.
Author: Taff, Anita.

Abstract: Hundreds of resellers claim that despite a ruling issued by the US Federal Communications Commission (FCC), AT and T is still withholding Tariff 12 contracts. The resellers are most interested in purchasing Option 58, which offers highly competitive rates for inbound and outbound switched services. They claim that AT and T is in violation of several FCC rules as well as the Communications Act of 1934. AT and T, which has been trying to eliminate Option 58, denies that resellers are obstructing its efforts to modify or discontinue the tariff.

Descriptors..

Company: American Telephone and Telegraph Co. (Services).
Topic: Value-Added Resellers
Tariff
Vendor Relations
Legal Issues.

Record#: 12 339 751.



**A PROPOSAL
TO ASSESS THE BUSINESS OPPORTUNITY
FOR OFFERING WAN SERVICES TO THE
GLOBAL MARKETPLACE**

Submitted to:

Corporate Telecommunications

Digital Equipment Corp.

Littleton, MA

February 21, 1992
(Revised Version)

INPUT

1280 Villa Street
Mountain View, CA 94041
415-961-3300
Fax: 415-961-3966

The Atrium at Glenpointe
400 Frank W. Burr Boulevard
Teaneck, NJ 07666
201-801-0050
Fax: 201-801-0441



I. OBJECTIVES

Corporate Telecommunications (CT) within Digital is assessing the business opportunity for offering end-to-end connectivity and value-added services to the global marketplace.

INPUT has been invited to submit a proposal which would help Digital evaluate this opportunity. The research would focus on the size and nature of the opportunity. This proposal describes the first phase of evaluation, concentrating on market issues.

II. SCOPE

The overall scope of this study is described in the "Business Planning Content Guide" which was reviewed with INPUT in a meeting with CT staff on January 24. This phase will concentrate on "Market Analysis" (Section III). Other sections, especially Section V, "Financial Plans and Business Models", would be addressed in a later phase.

INPUT's approach to this project will address the following:

- (1) The size and nature of the business opportunity available to Digital in general for "connectivity" for (A) Digital's transmission network, for (B) Digital's data network and for (C) value-added services (size by geography - U.S., Europe, GIA) ✓
- (2) What are the risks in providing "connectivity" (i.e., regulatory, legal, security, barriers to entry, competitive, impact from carriers on Digital, investment, return, etc.)
- (3) What is the relation between providing end-to-end connectivity services and providing systems integration services (using the concept "systems integration" in the broadest sense)? To what extent is outsourcing an issue with customers? ✓
- (4) Does Digital as a corporation have special advantages or disadvantages in supplying these services? ✓
- (5) What are the factors which will affect the size and growth of this market? How similar will conditions be in the U.S., Europe and GIA? ✓
- (6) Will Digital be more successful by creating a wholly-owned subsidiary (i.e., separate company) in providing WAN services to the marketplace? No ✱



INPUT will focus on the opportunity across a cross-section of potential customers. Additional customer sets can be researched in later phases.

INPUT expects that issues will be refined in the course of the project, as a result of initial discussions with CT staff as well as feedback from customer interviews.

NOTE: GIA specifically refers to Hong Kong/Singapore, Japan, and Australia, for purposes of INPUT's evaluation.

III. METHODOLOGY

INPUT will utilize the following sources of information for this project:

- Prior research that INPUT has conducted in this area including the following publicly available studies:
 - World Wide Information Services Market
 - Network Integration
 - Network Operations Management
 - U.S. Network Services Market
 - European Network Services Market
 - Pacific Rim Network Services Market
- Interviews with potential customers for this service, in the U.S., Europe and GIA
- Interviews (limited) with Digital staff



- The insight and overall market knowledge gained from prior custom research and consulting, including:
 - A year-long engagement with one of the world's largest enterprises assisting them in evaluating the market opportunities for offering their internal information systems capabilities to the commercial market. Included was an analysis of the opportunities in offering services on their very large private network.
 - A study for a significant organizational unit within a very large telecommunications company which examined how their services could be offered on a more commercial basis. This included developing a business plan for an expanded series of services.
 - Several studies for large financial services firms in which internally-developed products and services were evaluated for their appropriateness for being offered to a wider commercial market. These studies involved considerable external market research.

The following describes the activities of INPUT in this project. In specific instances noted, INPUT will require information or other assistance from CT.

There will be initial discussions with CT staff to refine the scope, as well as to begin preliminary work on interview guides and potential value-added services.

After approval, INPUT will meet with CT staff to review in more detail current and planned offerings and research materials already obtained. INPUT will suggest to Digital the most viable WAN offerings for Digital to present to the marketplace. Digital will prioritize its offerings from the standpoint of its ability to deliver.

As soon as the questionnaire contents are finalized, INPUT will begin interviewing prospective customers.

INPUT recommends that twelve (12) prospective customers be interviewed in the U.S., twelve (12) in Europe, and twelve (12) in GIA. (Note: For purposes of pricing, INPUT is assuming four interviews in Japan.) INPUT anticipates that multiple interviews will be held in many organizations (e.g., CIO, Telecomm Director, CFO and/or general managers). For this study INPUT does not recommend a large survey panel oriented toward producing extensive quantitative analyses. Instead, INPUT intends to obtain in-depth information to help put boundaries around this developing market. As an incentive to take part in the study, respondents will be offered a summary of the study. (This will not contain proprietary material and will be reviewed by Digital before release.)



Digital and INPUT will review company names and specific contact names where feasible. Since this project is to be completed as quickly as possible, Digital should supply alternate company names to allow for absence or other inability to take part in interviews by key respondents. At the kickoff meeting INPUT and Digital will review the advantages and disadvantages of Digital's name being associated with the interview research for specific companies.

Digital will make available to INPUT for review and validation Digital-developed information and analyses concerning legal and regulatory issues. This should be provided prior to March 9.

INPUT also recommends that six (6) interviews (two per-geography: U.S., Europe and GIA) be conducted with potential distributors of these services to generally assess this channel. A more detailed investigation can be made in a later phase, if warranted.

INPUT will keep Digital informed of the project status on a regular basis. Approximately one-quarter of the way through the customer interviews, INPUT will hold a progress review meeting with Digital by telephone. If there are preliminary findings which suggest a change in research direction, these findings will be brought up and discussed in depth.

INPUT will analyze the interviews and integrate information available from other sources. INPUT will prepare its findings in two forms: overhead transparencies and a written report.

INPUT will prepare two presentations to the DTMC. The initial presentation, at the end of the week of March 30 will provide a preliminary overview of INPUT's findings. This approach will be necessary because interviews will have been only partially completed and only preliminary analysis will have been conducted. Consequently, little or no hard or quantitative data (market sizes, growth rates, market shares, etc.) may be available for that presentation. INPUT will make every effort for this presentation to be as complete as possible. However, INPUT may only be able to provide assessments of general directions, market sizes and opportunities for general types of services. Even though much of the information will necessarily be qualitative, INPUT believes that it should be possible to assign probabilities to many of the issues facing CT, such as product viability, risks, organizational structure, etc.

The second presentation to the DTMC (by video) will incorporate the data and findings to be contained in the written report. The report will be held in draft form, however, so that issues raised as a result of the second DTMC presentation can be incorporated into the report.



IV. DELIVERABLES

In the course of this study, Digital will receive the following materials which will provide Digital with an understanding of the opportunities in this market:

- The findings of the study in overhead transparency format
- A written report following the format provided in the "Business Planning Content Guide" (as further modified in the meeting of January 24)
- Copies of customer interview data, if desired (with identities removed as necessary)
- Two presentations to DTMC

V. SCHEDULE

The following schedule describes the activities by week. The contract must be signed by March 2 to maintain this schedule.

Week
→ Beginning: Activity

- | | |
|------|--|
| 2/17 | Digital provides verbal approval for project |
| 2/24 | Preliminary work on project begins |
| | <ul style="list-style-type: none">- Digital prepares lists of contacts- INPUT drafts interview guides- INPUT prepares generic list of connectivity services- INPUT and Digital define project specifics further |
| 3/2 | Contract signed |
| | INPUT meets with CT |
| | <ul style="list-style-type: none">- Initial assessment of CT services to be offered- Review interview guides |



- 3/9 INPUT meets with CT
- CT services assessment completed
 - Interview guide finalized
- Customer interviewing begins (U.S., Europe, & GIA)
- 3/30 INPUT and CT staff hold a progress review (3/30)
- INPUT presents preliminary overview findings to DTMC (4/3)
- 4/6 Customer interviews completed
- INPUT conducts additional research, as required
- INPUT completes analysis of interviews
- 4/13 INPUT prepares a presentation version of findings and begins draft report
- 4/20 Review of findings with CT staff
- 4/27 INPUT presents complete findings in overhead transparency format to DTMC (via video)
- 5/4* INPUT delivers final report draft for review
- * Or one week after initial presentation, if presentation is delayed
- 5/11 Digital comments received
- 5/18 Final report delivered



VI. FEE

The professional fee for this project is \$50,000. In addition, out-of-pocket expenses (including travel, telephone, report preparation, and production expenses) will be billed at cost. Out-of-pocket expenses are estimated to be no more than 10% of the professional fee. One-half of this fee (\$25,000) is due and payable on the authorization of this project. The remainder of the professional fee and out-of-pocket expenses will be invoiced upon submission of the written report.

This proposal is valid for thirty days unless extended in writing.

VII. AUTHORIZATION

To authorize the project as specified, please sign and return one copy of this proposal, along with the initial fee. Upon acceptance by INPUT, a countersigned copy of the proposal will be returned to Digital.

AUTHORIZED BY:
Digital Equipment

ACCEPTED BY:
INPUT

Name

Name

Title

Title

Date

Date



CONTACT REPORT

INPUT

Staff: Init. PAC Init. _____☐ INPUT office☐ Client Office☒ OtherSids ConfContact Date: 7/22/92Date Written: 7/27/92Peter E. Brown
Director of Telecommunications**digital**Digital Equipment Corporation
550 King Street, LKG1-2/G09
Littleton, MA 01460
A=mci;P=digital;O=digital;OU=lkg.
Internet: Brown@lkg.dec.com
508.486.7350

DISTRIBUTION:

Prog./Proj. ID _____

Action

Info.

By When

Describe Action-F/U

Tom

Mail Log.

- Suss Susan Schweitzer and Peter at conf. Peter said it was O.K.
- Their unit has been moved under Ron Gullotti - not what was recommended.
- Pete wants to talk about opportunities

☐ Continued over



INPUT

Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 Tel. (201) 801-0050
Fax (201) 801-0441

June 24, 1992

Ms. Susan Schweizer
Digital Equipment Corp.
Little, MA

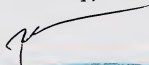
Via Fax: 508-952-3023

Dear Susan:

This will certify that INPUT has completed all the work associated with the study to assess the business opportunity for offering WAN services to the global marketplace (PO TV 829622).

The accompanying invoice of this date is INPUT's final invoice.

Sincerely,



Thomas O'Flaherty
Vice President

a:tof:DEC-SS



INPUT

Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 (201) 801-0050
Fax (201) 801-0441

FAX TRANSMITTAL FORM

Date: May 24 1992
To: Name: Claire Wheeler
Tel./Location: OTN 227-3901
Co.: _____
Fax No: 508-952-3023
From: Fan O'Flaherty
Subject: _____

Confidential: Y/N
Urgent: Y/N

Page: 1 of 2

File: Chron
Contact
Other:



IT Consultants

22a St. James' Street

Brighton

BN2 1RF

Telephone: (0273) 605834

Reply to: Gavin Ritchie, BA(OU), DMS, MBCS, MBIM

INPUT LTD
PICOARILLY HOUSE
33-37 REGENT STREET
LONDON SW1Y 4NF

account reference
47/204/EN08
date
14 MAY 1992

INVOICE

TO PROFESSIONAL SERVICES, TELEPHONE INTERVIEWING
PROJECT YNDC2 - ADDITIONAL QUESTIONNAIRES:

- ICI
- LLOYDS OF LONDON
- SOCIÉTÉ INTL DE TÉLÉCOMMUN. AÉRON.
- SOCIÉTÉ GÉNÉRAL (BANK)
- PREUSAG AG
- ROWNTREE/NESTLÉ
- HÖSCHT (HÖSCHT)
- HOFFMANN LAROCHE

PLUS NOTES ON: ABB (Asea Brown Boveri)

: 'outsourcing' article (CMG Study)

£

1600=00

1600=00

NOT VAT REGD vat at NIL %

Total Amount Due £

1600=00

recd 6/25
Approved 6/30
per
YNDC2



INPUT

Plocadilly House, 33/37 Regent Street, London SW1Y 4NF Tel. (44) (071) 493-9335
Fax (44) (071) 629-0179

FAX TRANSMITTAL FORM

DESTINATION: input N.J.

FAX NUMBER: _____

ATTENTION: Tom O'Hare

NUMBER OF PAGES: 1 OF 2

CONFIDENTIAL CORRESPONDENCE: YES _____ NO _____

URGENT: YES _____ NO _____

DESCRIPTION:

Answer to our telegram yesterday, I
was mistaken - i.e. the costs for YN-22.
Please find attached copy of invoice
from G. R. R. re costs of
first 8 interviews. This invoice
has not been processed through
m. view accounts yet. I have left
a message with G. R. R. requesting
he let me know of any expenses to be
invoiced. Trust the attached is O.K.
.....
Please call if any queries.

FROM: Wendy Lewis

DATE: 25-6-92

INPUT: _____

PROJECT CHARGE CODE: _____



INPUT⁺Piccadilly House, 33/37 Regent Street, London SW1Y 4NF Tel. (44) (071) 493 9335
Fax (44) (071) 629-0179**FAX TRANSMITTAL FORM**DESTINATION: input n3

FAX NUMBER: _____

ATTENTION: Tom O'FlahertyNUMBER OF PAGES: 1 OF 2

CONFIDENTIAL CORRESPONDENCE: YES _____ NO _____

URGENT: YES _____ NO _____

DESCRIPTION:

Further to our telecon yesterday, I
was mistaken - ie. the calls for YN & 2.
Please find attached copy of invoice
for Crown Ektive re costs of
first 8 interviews. This invoice
has not been processed through
my VMS accounts yet. I have left
a message with G. Ektive requesting
he let me know of any expenses to be
invoiced. This he returned is O.K.
Please call if any queries.

FROM: Wendy LewisDATE: 25-6-92

INPUT: _____

PROJECT CHARGE CODE: _____

IT Consultants

22a St. James' Street
Brighton
BN2 1RF

Telephone: (0273) 605834

Reply to: Gavin Ritchie, BA(OU), DMS, MBCS, MBIM

INPUT LTD
PROCARILLY HOUSE
33-37 REGENT STREET
LONDON SW1Y 4NF

account reference
47/204/INV08
date
14 MAY 1992

INVOICE

TO PROFESSIONAL SERVICES, TELEPHONE INTERVIEWING
PROJECT YNDC2 - ADDITIONAL QUESTIONNAIRES.

- ICI
LLOYDS OF LONDON
• SOCIÉTÉ INTL DE TÉLÉCOMMS. AÉRON.
• SOCIÉTÉ GÉNÉRAL (BANK)
• PREUSAG AG
• ROWNTREE/MOSELÉ
• HÖSCHT (HÖESCHT)
• HOFFMANN LAROCHE

plus notes on: ABB (Asea Brown Boveri)
: 'outsourcing' article (CMG study)

£

1600=00

1600=00

NOT VAT REGD vat at HCL %

Total Amount Due £

1600=00

recd 6/25
Approved 6/30
per
YNDC2

INPUT®

Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 (201) 801-0050
Fax (201) 801-0441

FAX TRANSMITTAL FORM

Date: 6/30
To: Name: Renee
Tel./Location: _____
Co.: _____
Fax No: _____
From: TJR
Subject: _____

Confidential: Y/N
Urgent: Y/N

Page: 1 of 3

File: Chron
Contact
Other:

YNDC2 Invoice from UK approved for
pay ment



P.01 *

TRANSACTION REPORT *

JUL- 1-92 WED 12:00 *

DATE START RECEIVER TR TIME PAGES NOTE *

TUL- 1 11:58 14159613967 1'56" 3 OK *



JARCO PTY. LTD.

A.C.N. 009 359 979

26 Tilton Tce., City Beach W.A. 6015

Telephone: 385 8088

INPUT

Atrium at Glenpointe,
400 Frank W. Burr Blvd,
Teaneck,
NJ 07666

19th June 1992

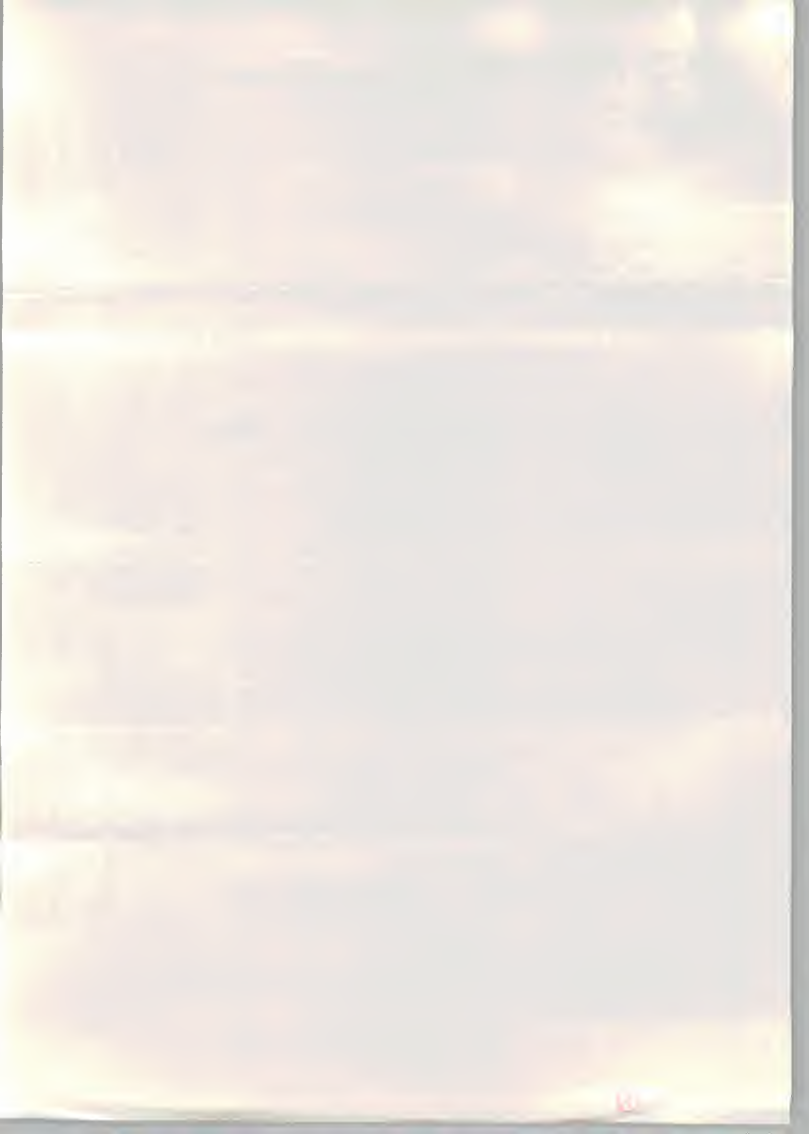
Invoice for participation in the communications
survey for Australia, Hong Kong & Singapore.

9 interviews @ US\$80 per interview	US\$720.00

	US\$720.00
	=====

If it is easier to pay this in U.S dollars than to
convert to A\$ then it can be paid to my husband Paul
Ricker and mailed to him at G. Heilemann Brewing Co.,
9399 W. Higgins Rd, Suite 700, Rosemont, Illinois 60018.





JARCO PTY. LTD.

A.C.N. 009 359 979

26 Tilton Tce., City Beach W.A. 6015

Telephone: 385 8088

INPUT

Atrium at Glenpointe,
400 Frank W. Burr Blvd,
Teaneck,
NJ 07666

19th June 1992

Invoice for participation in the communications
survey for Australia, Hong Kong & Singapore.

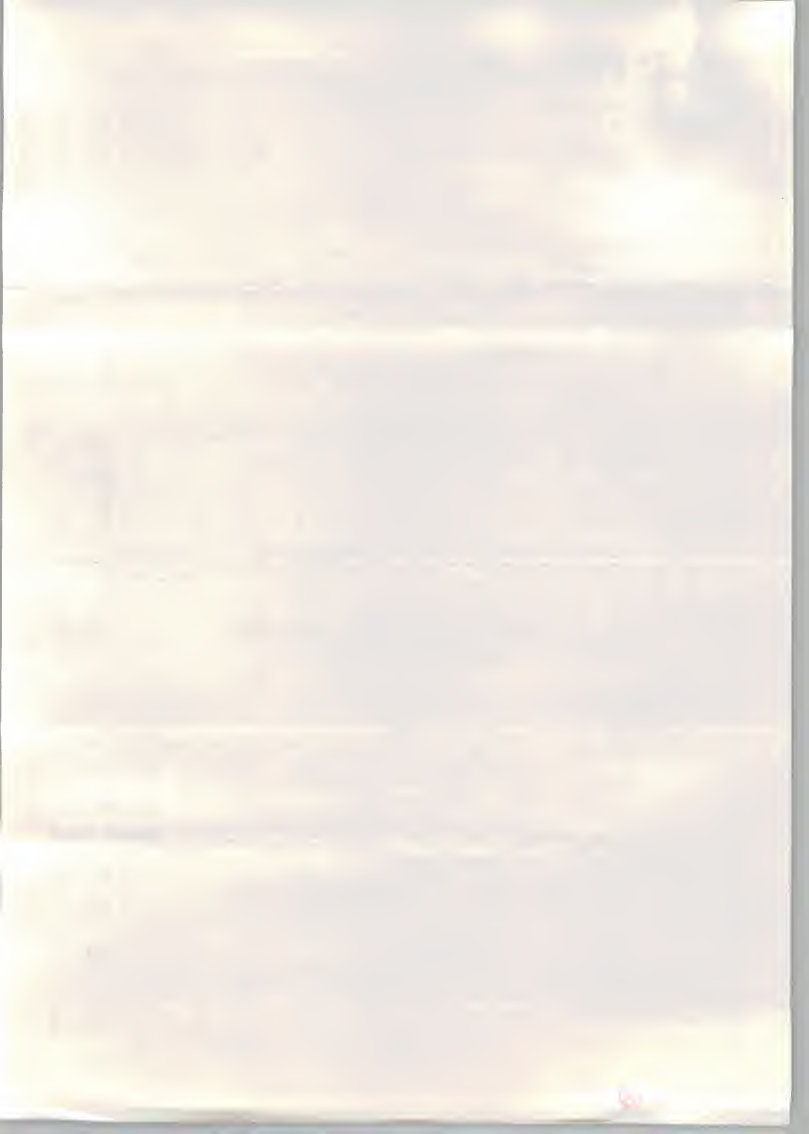
Telephone expenses (as per attachment)

A\$195.00

=====

I don't have the Fax expenses at present but
will send that a.s.a.p. when I receive it.







Telecom Australia Bill

Australian and Overseas
Telecommunications Corporation
Limited
A.C.N. 051 775 556

Your account number

09 447 7832 146 2 443

Date of issue

19 / 05 / 92

Bill enquiries

09-344 0133

Total of last bill

We received

Balance

Total of this bill

\$130.38

— \$131.00

= \$0.62CR

+ \$313.09

=

Total amount payable

\$312.47

Payment due by

05 / 06 / 92

MR D R SHILCOCK
2 JOPE PL
DUNCRAIG 6023

Office
Use

Your Telephone Service

09-447 7832

Call charges

				\$
3-1	Metered calls	7 Feb to 2 Apr	189 units at \$0.24 each	45.36
3-2	Metered calls	2 Apr to 7 May	127 units at \$0.25 each	31.75
3-0	STD		<i>See over for details</i>	84.68
7-0	0011 IDD International		<i>See over for details</i>	110.67
10-0	Information calls		<i>See over for details</i>	0.25
2-0	Service and equipment	17 May to 16 Aug		40.38

Total of this bill

\$313.09

Continued Overleaf



Telecom Australia

Please return this section with your payment

Your account number

09 447 7832 146 2 443

Bill enquiries

09-344 0133

Total amount payable

\$312.47

Payment due by

05 / 06 / 92

Mailing your payment

Please detach this payment slip and return it together with your cheque (or credit card payment details on the reverse). Cheques to be made payable to Telecom Australia.

Send to:

Telecom Australia
GPO Box 9901
Perth WA 6001

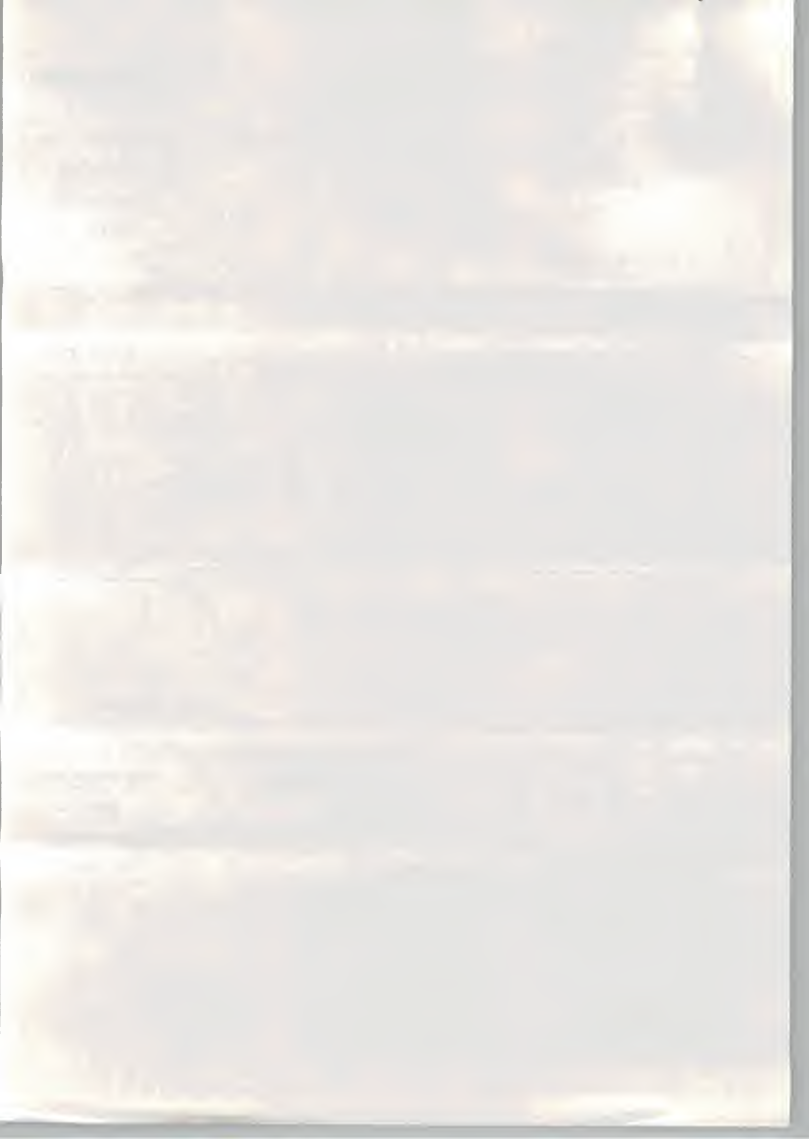
Paying in person

Please present this page intact and make your payment by cash or cheque at any Post Office or at any Westpac Branch. Cheques to be made payable to Telecom Australia.

Pay by phone

Call the telephone number 008 093 309 (free) during business hours. Please ensure that you have your credit card details handy.

MR D R SHILCOCK
2 JOPE PL
DUNCRAIG 6023



Office
Use

Itemised Call Details

STD calls

	Date	Time	Place	Number	Rate	Min:Sec	\$
3-3	31 Mar	10:51 am	Melbourne	032706111	Day	2:31	1.68
3-4	31 Mar	11:07 am	Melbourne	032706228	Day	2:43	1.68
3-5	31 Mar	11:39 am	Sydney	022363636	Day	2:37	1.68
3-6	31 Mar	01:29 pm	Sydney	022399100	Day	1:43	1.20
3-7	31 Mar	01:36 pm	Sydney	029570301	Day	3:42	2.16
3-8	01 Apr	08:00 am	Canberra	062312917	Day	0:12	0.24
3-9	01 Apr	08:05 am	Wamboin	062383450	Day	4:54	2.88
4-1	01 Apr	09:03 am	Melbourne	036446803	Day	1:29	0.96
4-2	01 Apr	09:05 am	Melbourne	036665444	Day	3:33	2.16
4-3	01 Apr	09:09 am	Sydney	029511444	Day	0:29	0.48
4-4	01 Apr	09:10 am	Melbourne	032684111	Day	3:19	1.92
4-5	01 Apr	09:24 am	Sydney	022261122	Day	9:41	5.76
4-6	01 Apr	09:35 am	Sydney	028875152	Day	2:57	1.92
4-7	01 Apr	09:38 am	Sydney	029025666	Day	0:16	0.24
4-8	01 Apr	09:39 am	Melbourne	036446803	Day	0:53	0.72
4-9	07 Apr	09:24 am	Sydney	029025666	Day	3:32	2.00
4-10	09 Apr	09:15 am	Melbourne	032684111	Day	0:57	0.50
4-11	09 Apr	09:16 am	Sydney	029570301	Day	0:36	0.50
4-12	12 Apr	01:03 pm	Byford	095251479	Economy	2:25	0.25
4-13	13 Apr	10:33 am	Sydney	024289333	Day	1:09	0.75
5-1	14 Apr	07:12 am	Melbourne	036446806	Economy	0:23	0.25
5-2	14 Apr	08:13 am	Melbourne	036446806	Day	5:00	2.75
5-3	22 Apr	10:22 am	Melbourne	032684111	Day	30:40	16.50
5-4	24 Apr	08:00 am	Sydney	029570301	Day	0:56	0.50
5-5	24 Apr	08:08 am	Sydney	029025111	Day	0:05	0.25
5-6	24 Apr	08:09 am	Sydney	029025666	Day	1:25	1.00
5-7	24 Apr	09:29 am	Melbourne	036093333	Day	0:43	0.50
5-8	24 Apr	09:49 am	Melbourne	036093960	Day	0:24	0.25

Continued page 3

Are you having difficulties paying?

If you are having difficulties in paying your bill, please call us during business hours on the billing enquiries number. Payment assistance options available for residential services include more frequent billing, the Budget Payment Card or other arrangements.

Telephone rental concession voucher

If you have a Telephone Rental Concession Voucher please enclose it with your payment if paying by mail or bring it with you if paying in person.

Please note that these vouchers cannot be accepted if the "Pay by Phone" method is used.

Metered calls

Includes Local calls and other calls not separately listed on your bill.

A meter connected to your service at the local exchange records the call charges in units. Each unit is equal to the price of a local call.

Are you moving?

Now is the time to contact the Sales Section of the Telecom Office that services your new address.

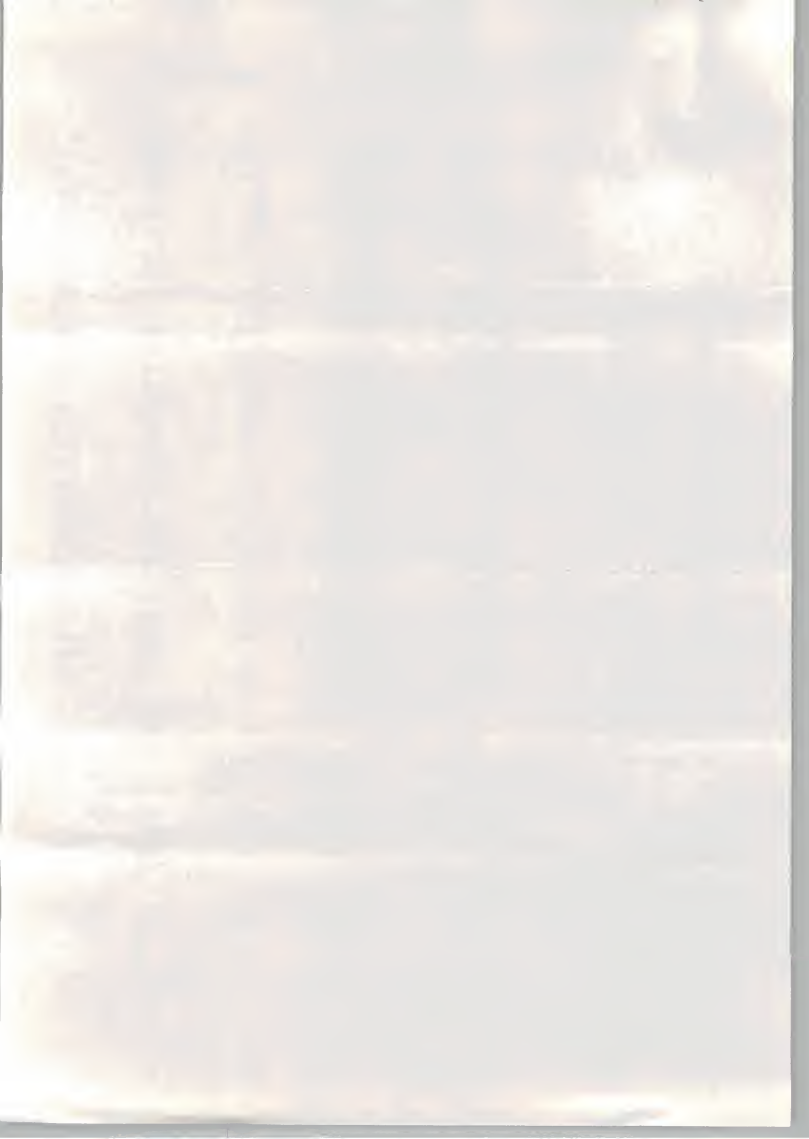
Telecom Offices are listed in the Information Section of the White Pages Telephone Directory.

Credit card payments

Bankcard Card number	Mastercard	Visa	Redicard
-------------------------	------------	------	----------

Expiry Date

Signature



Office
UseItemised Call Details *continued*STD calls *continued*

	Date	Time	Place	Number	Rate	Min:Sec	\$
5-9	24 Apr	09:50 am	Melbourne	036093893	Day	3:25	2.00
5-10	27 Apr	11:11 am	Sydney	029570301	Day	0:58	0.50
5-11	29 Apr	09:07 am	Melbourne	036903022	Day	0:49	0.50
5-12	29 Apr	09:08 am	Sydney	029080777	Day	3:07	1.75
5-13	29 Apr	09:12 am	Sydney	028789611	Day	0:18	0.25
6-1	29 Apr	09:13 am	Sydney	028889266	Day	31:23	17.00
6-2	29 Apr	11:24 am	Sydney	029570301	Day	0:24	0.25
6-3	29 Apr	11:25 am	Sydney	029570588	Day	0:13	0.25
6-4	30 Apr	07:34 am	Wamboin	062383450	Economy	1:25	0.50
6-5	30 Apr	07:54 am	Sydney	029570301	Economy	0:11	0.25
6-6	30 Apr	07:55 am	Sydney	029570588	Economy	0:50	0.25
6-7	30 Apr	07:58 am	Melbourne	036093893	Economy	0:50	0.25
6-8	30 Apr	12:29 pm	Sydney	029570588	Day	1:46	1.00
6-9	04 May	01:37 pm	Sydney	029570354	Day	0:05	0.25
6-10	04 May	01:43 pm	Sydney	029570301	Day	0:21	0.25
6-11	07 May	09:58 am	Sydney	029570301	Day	0:08	0.25
6-12	07 May	10:00 am	Melbourne	036093893	Day	0:36	0.50
6-13	07 May	12:39 pm	Sydney	029570301	Day	1:01	0.75
7-1	08 May	11:18 am	Melbourne	036093960	Day	10:09	5.50
7-2	08 May	11:32 am	Sydney	029570301	Day	1:00	0.75

0011 IDD International calls

	Date	Time	Place	Number	Min:Sec	\$
7-3	31 Mar	10:55 am	Hong Kong	8528221111	8:15	12.48
7-4	31 Mar	11:04 am	Hong Kong	8527475000	0:53	1.44
7-5	31 Mar	11:11 am	Singapore	652278700	0:42	1.20
8-1	31 Mar	11:12 am	Singapore	653229881	2:09	3.36
8-2	31 Mar	11:15 am	Singapore	652253848	6:38	10.08
8-3	31 Mar	11:26 am	Singapore	657456998	1:24	2.16
8-4	31 Mar	11:35 am	Singapore	652258888	2:18	3.60
8-5	31 Mar	01:27 pm	Hong Kong	8527474000	0:22	0.72
8-6	31 Mar	02:35 pm	Hong Kong	8527474000	4:30	6.72
8-7	31 Mar	02:40 pm	Singapore	653312813	4:08	6.24
8-8	01 Apr	09:20 am	Singapore	652253848	1:15	1.92
8-9	08 Apr	10:32 am	Singapore	652253848	2:47	4.25
8-10	08 Apr	10:36 am	Singapore	653229881	2:22	3.50
8-11	08 Apr	10:40 am	Hong Kong	8527474000	0:45	1.25
8-12	08 Apr	10:41 am	Hong Kong	8527474002	0:58	1.50
8-13	09 Apr	09:03 am	Singapore	653229881	0:16	0.50
9-1	09 Apr	09:04 am	Singapore	655309671	0:34	1.00
9-2	09 Apr	09:10 am	Singapore	653312813	3:18	5.00
9-3	09 Apr	10:50 am	Singapore	653229881	0:31	0.75
9-4	24 Apr	10:31 am	Singapore	653229881	1:27	2.25
9-5	24 Apr	10:34 am	Singapore	653312813	0:57	1.50
9-6	24 Apr	10:36 am	Singapore	655303228	1:14	2.00
9-7	24 Apr	10:38 am	Hong Kong	8527474002	0:30	0.75
9-8	27 Apr	11:15 am	Singapore	653312813	3:05	4.75

Continued Overleaf



Office
UseItemised Call Details *continued*0011 IDD International calls *continued*

	Date	Time	Place	Number	Min:Sec	\$
9-9	30 Apr	12:23 pm	Singapore	653229881	5:45	8.75
9-10	07 May	12:41 pm	Singapore	653229881	3:51	5.75
9-11	08 May	11:00 am	Singapore	653229881	11:36	17.25

Information calls

	Date	Time	Number	Min:Sec	\$
10-1	27 Apr	11:55 am	005539299	0:24	0.25



EXHIBIT-1

Levels of Communication Services

3	Network-Based Applications (Examples)	<div>Electronic Mail (within an enterprise)</div> <div>Electronic Mail (between enterprises)</div> <div>Employee Locator (on-line)</div> <div>Electronic Data Interchange (EDI)</div>							
2	Enhanced Communications Services (Examples)	OSI	TCP/ IP	DEC Net	SNA	Packet Switching	Frame Relay	Bulk Data Transfer	Video
1b	Value-added bandwidth (examples)								
1a	Pure bandwidth (e.g., tariffed circuits from carriers)								

YNDC2



DETAIL

• White - Contract • Green - Fulfillment • Yellow - Invoice • Pink - Originator • Goldenrod - Sales Manager





Cost C.	Acct.	Act Code	Job Number	Buyer Code	Requisitioner-Location-Extension

digital
DIGITAL EQUIPMENT CORPORATION

This No. must appear on all invoices, packing slips, and packages

PURCHASE ORDER NO. TV-829672
CHANGE ORDER NO.
V
E
N
D
O
R

INPUT
ATRIUM AT BLENPOINTE
400 FRANK LANK ROULEVARD
CLARK, N.J. 07066

S
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P

T
O

SERVICE

Confirm: ☐ Yes ☒ No

THIS ORDER IS SUBJECT TO THE CONDITIONS ON THE FACE AND REVERSE HEREOF

DATE	REQUISITION NO.	SHIP VIA	F.O.B.	TERMS	BASIC AGREEMENT NO.	DELIVERY DATE
12 MAR 92	829672			02 / 0		SEE
ITEM	QUANTITY	PURCH UNIT	STOCK NUMBER - DESCRIPTION	UNIT PRICE	AMOUNT	

EXPENSES: Expenses that are approved in advance will be reimbursed to input in accordance with the payment terms of this Purchase Order. All invoices submitted against this Purchase Order which identify expenses must be accompanied by the appropriate receipts.

SPECIAL TERMS: Digital maintains the right to terminate this Purchase Order at any time for any reason, and is only obligated to pay for services provided up to and inclusive of the termination date.

CRIMINALIAISON: All work and activity performed against this Purchase Order will be co-ordinated by Digital's Mike Malone.

INVOICES: All invoices submitted against this Purchase Order are subject to the inspection and approval of the Buyer's Purchasing Department.

NO DIFFERENT OR ADDITIONAL TERMS PROPOSED BY SELLER SHALL APPLY

BILL TO:

DIGITAL EQUIPMENT CORP. *****PAGE 2/CONTINUED NEXT PAGE
ATTN: ACIS DEPARTMENT
PO BOX 1
MAYNARD, MA 01948 (617) 508-9411

INVOICE-IN DUPLICATE
TO ACCOUNTS PAYABLE
DEPARTMENT

SPECIAL INSTRUCTIONS:

Sales Tax	
<input type="checkbox"/> Tax	<input checked="" type="checkbox"/> No Tax

TAX EXEMPT NO:

FOR FURTHER INFORMATION CONTACT:

JOHN
MCDONOUGH
508-486-5595

FOR PURCHASING USE ONLY

[Signature] 3/19/92
Buyer Signature Date
Approval Signature Date

VENDOR COPY
EN-01063-08-REV F (6N)



INTERNATIONAL COMMUNICATIONS STUDY: TOPICS SUMMARY

ENVIRONMENT

1. Major characteristics of voice/data network(s)
 - Nodes
 - Protocols, standards
2. 1992 costs and percentage change
 - In-house personnel
 - Circuits/transmission costs
 - Equipment
 - Facilities
 - External services vendors
 - Overhead
 - Total

General trends in communications costs 1992-1994
3. New applications/functions planned for data network in next three years
4. Performance standards established/planned. Changes.
5. Strong points of existing data network. Improvements planned.
Barriers to improvement.
6. Importance of changes to data network. Types of changes:
 - Reduce costs
 - Reduce head count
 - Improve staff skills
 - Improve service reliability
 - Improve responsiveness to internal users
 - Improve responsiveness to customers
 - Offer new communications service
 - Outsource services or functions



LEVELS OF COMMUNICATIONS SERVICES (see exhibit)

7. Current use of "Network-based Applications". Size/cost. Supplier. Satisfaction. Plans.
8. Importance of "Enhanced Services"
 - OSI-based network
 - TCP/IP network
 - DECNet
 - SNA
 - Packet switching
 - Frame relay
 - Bulk data transfer
 - Video
9. Current use of "Value-added bandwidth" services
 - Now using: Type. Source. Trade-offs.
 - Considering using: Type. Source. Trade-offs
 - Not using/considering: Under what conditions would use be considered? Trade-offs.
10. Must a vendor offer all three levels of services to be considered viable?
11. Amount of knowledge of specific vendors in each of three areas (in exhibit). Rating of capabilities.
 - AT&T
 - British Telecom
 - Digital Equipment (DEC)
 - EDS
 - GE Information Services (GEIS)
 - IBM
 - Infonet
 - Regional U.S. Telcos (as a group)
 - National telecomm carrier [by non-U.S. respondents]



Cost C.	Acct.	Act. Code	Job Number	Buyer Code	Regulation/Location-Extension

digital
DIGITAL EQUIPMENT CORPORATION

V
E
N
D
O
R

INPUT
ATRIUM AT GLENPOINTE
400 FRANK BURN BOULEVARD
FRANKLIN, NEW JERSEY 07060

S
H
I
P

T
O

(082)
② YNDC2 Digital Equip

This No. must appear on all invoices, packing slips, and packages

PURCHASE ORDER NO. TV-829622
CHANGE ORDER NO.

SERVICE

Confirm: ☐ Yes ☒ No

THIS ORDER IS SUBJECT TO THE CONDITIONS ON THE FACE AND REVERSE HEREOF

DATE	REQUISITION NO.	SHIP VIA	F.O.B.	TERMS	BASIC AGREEMENT NO.	DELIVERY DATE
	342675			02 / 3 NET 30		

ITEM	QUANTITY	PURCH UNIT	STOCK NUMBER - DESCRIPTION	UNIT PRICE	AMOUNT
			<p>Delivered prior to payment.</p> <p>This Purchase Order incorporates the terms and conditions contained in the Consulting Services Agreement between Digital Equipment Corporation and Innut dated 02/11/92, a copy of which Innut acknowledges to have in their possession.</p> <p>SERVICE BEGINNING DATE : 2 MAR-92 SERVICE EXPIRATION DATE: 18-MAY-92</p> <p>TOTAL NOT-TO-EXCEED</p> <p>TOTAL PURCHASE ORDER VALUE :</p> <p>NO DIFFERENT OR ADDITIONAL TERMS PROPOSED BY SELLER SHALL APPLY</p>		\$55,000.00

BILL TO:

DIGITAL EQUIPMENT CORP. *****PAGE 1 - 3/LAST PAGE *****
ATTN: ACCT. PAYABLE
PO BOX 13
MAYNARD, MA 01944 (PHONE: 617-408)493 9411)

**INVOICE IN DUPLICATE
TO ACCOUNTS PAYABLE
DEPARTMENT**

SPECIAL INSTRUCTIONS:

Sales Tax	
<input type="checkbox"/> Tax	<input type="checkbox"/> No Tax

TAX EXEMPT
NO:

FOR FURTHER INFORMATION CONTACT

JOHN N
WESMONGH
FOR PURCHASING USE ONLY

John Wesmough 3/19/92
Buyer Signature Date
Approval Signature Date



INPUT

CONFIDENTIAL—Property of INPUT

CONTACT REPORT

INPUT

Staff: Init: TPA Init: _____

☐ INPUT office ☒ Client Office ☐ Other _____

Contact Date: 3/4/92

Date Written: 3/10/92

Company <u>DBC</u>	DISTRIBUTION:			Prog./Proj. ID <u>440C2</u>
Name <u>Dave Cedrone et al</u>	Action	Info.	By When	Describe Action-F/U
Title <u>Corporate Telecommunication</u>	<u>TPA</u>	<u>PAC</u>		
Address				
Phone: () -				
Fax: () -				

Kick-off for DBC communication project

- Had current business explained. Had briefings from
 - Bob Igou on E-Mail etc
 - Jim Metzler on Network protocol system
 - Paul Speer on basic transmission capabilities
 - Mary Lou O'Neill on Video service

[Later ~~said~~ told for internal reasons not to stress video]
- Had lunch w/ Dave, Susan Schneider & Frederic Kunzi

Went well & learned following

- They have little knowledge of their prospects because they cannot provide contact names & in most cases, have selected "household names" for interviews. Dave was relieved when I said we would develop our own names & contacts as well.
- Supplying professional services is a nonstarter since they have little excess capacity now (not surprising). We will look only at overall market need here

☐ Continued over



to help in general long range
planning

DBZ
YNOC2

3/4/92

- They have 3 levels of service (see attached that was based on some of their briefing) (Partially)

p 2 of
2

(+
Questionnaire

They have relatively few offerings available in near future

- E-mail & employee locator
- DBENBT & OSI network
- "Enhanced" transmission (they have major doubts as to whether this has any market)

Meetings were invaluable to develop reality-based research plan

Questionnaire draft attached



Att to
Contact RPT
YNDCL 3/14/92

INTERNATIONAL COMMUNICATIONS QUESTIONNAIRE - DRAFT 3/9

INTRODUCTION: My name is _____ and I am with INPUT, an international research and consulting firm specializing in information services and communications. INPUT is conducting a study examining enhanced services in international data communications -- we are looking at both changing requirements as well as new sources for these services. We are interviewing companies in the U.S., Europe and the Pacific Rim.

We would like to have your firm take part in this study. In return we will provide you with a summary of our findings at no charge. We are not seeking proprietary information and no information that you supply will be published or publicly linked to your name or to your company's name.

First of all we would like some baseline information about your enterprise's communications networks.

1a. Do you have a single voice/data network?

Yes ___ No ___ (If yes, go to question 1c)

1b. Do you have a single data network or multiple networks?

Single ___ Multiple ___

1c. Please briefly describe the major characteristics of your data communications network(s), Prompts:

Number of total nodes:

Number of major nodes (define):

Locations:

Bandwidth:

Network protocols, standards



2a. How will your data communication costs for 1992 break down, using the following categories: [Note: If data communications costs cannot be easily separated from other communications costs, please note what is included.] What percent increase or decrease do you expect for 1993?

<u>Category</u>	<u>\$ Mill.</u>	<u>%Change</u>
In-house personnel	_____	_____
Circuits/transmission costs	_____	_____
Equipment	_____	_____
Facilities	_____	_____
Other services from external vendors	_____	_____
Overhead	_____	_____
Total	_____	_____

2b. What are the general trends in data communications costs that you see over the next three years? [Please explain.]

3. What new applications or functions are planned for your data network in the next three years? How will these affect your network's size and capabilities?

4. What type of performance standards have been (or will be) established for your data network? Are these currently being met? What changes are planned to improve your network performance?

5a. What would you say are the strong points of your data network now?

5b. What areas need improvement? What steps are you taking to make improvements? What, if anything, is preventing your organization from making needed improvements?



6a. I am going to read you a list of changes which some enterprises are considering making to their data networks. Please rate how important each of these is to your organization on a scale of 1 to 5, with 1 being not important at all and 5 being very important. For those you rate as a 4 or 5, please describe briefly what actions you have planned.

<u>Possible Changes</u>	<u>Rating</u>	<u>Reasons</u>
Reduce costs	_____	_____
Reduce head count	_____	_____
Improve staff skills	_____	_____
Improve service quality	_____	_____
Improve service reliability	_____	_____
Improve responsiveness to internal users	_____	_____
Improve responsiveness to customers	_____	_____
Offer new communications services	_____	_____
Outsource services or functions	_____	_____

6b. Are there any other changes which your organization is considering

My next group of questions concern different types of communications services as illustrated on the Exhibit "Levels of Communications Services" This divides communications services into the supply of pure bandwidth, enhanced services and network-based applications. In general, the services which are higher on the chart depend on or presuppose the existence of those lower on the chart. The exhibits provide examples of each type of service. Do you have any questions on how the exhibit lays out communications services?



7. Starting from the top level (#3): Please tell me which of these network-based applications you are currently using? What is the applications size and/or cost? What was the source/supplier? What is your general level of satisfaction -- why? What additional plans does your organizations have for the network applications area?

Application:

Size/cost:

Supplier:

Satisfaction:

Plans:

[repeat as necessary]

8a For enhanced communications services, which of these are important to you now and in three years (on a scale of 1 to 5, with 5 being very important)? For services rated 4 or 5, please describe your current and/or planned activities?

<u>Enhanced Services</u>	<u>Imp.</u>	<u>Reasons</u>
OSI-based network	___	_____
TCP/IP network	___	_____
DECNet	___	_____
SNA	___	_____
Packet Switching	___	_____
Frame Relay	___	_____
Bulk Data Transfer	___	_____
Video	___	_____

8b. Which other services which are important to your firm?



9. Are you receiving what we are calling "value-added bandwidth" services now?

Yes ____ No ____

If Yes: What type of value-added services? From what source? What are the price/performance trade-offs?

If No: Are you considering such services?

Yes ____ No ____

If Yes: Which ones? From what source? What price/performance trade-offs would you find acceptable?

If No: Under what conditions would you consider such services? What price/performance trade-offs would you find acceptable?

10. Do you believe that a vendor offering communications services must offer all potential services, on the three levels that we have been discussing, in order to be considered a viable vendor? Or is it acceptable for a vendor to offer a more limited selection of services? Why?

Must offer all ____

Can offer a limited selection ____



11. I am going to read you a list of vendors. I would like you to rate these vendors from the standpoint of the amount of experience you have had with them as a supplier in each of the three areas (1 = no experience; 5 = a great deal of experience) as well as your rating of each vendor's capabilities in each area (1 = low capabilities; 5 = high capabilities). Please give any additional comments as well on these firms or any other firm.

<u>Vendor</u>	<u>Rating</u>	<u>Cap.</u>	<u>Comment</u>
AT&T			
Applications	_____	_____	_____
Enhanced Services	_____	_____	_____
Value-added Bandwidth	_____	_____	_____
British Telecom			
Applications	_____	_____	_____
Enhanced Services	_____	_____	_____
Value-added Bandwidth	_____	_____	_____
Digital Equipment (DEC)			
Applications	_____	_____	_____
Enhanced Services	_____	_____	_____
Value-added Bandwidth	_____	_____	_____
EDS			
Applications	_____	_____	_____
Enhanced Services	_____	_____	_____
Value-added Bandwidth	_____	_____	_____
GE Information Services (GEIS)			
Applications	_____	_____	_____
Enhanced Services	_____	_____	_____
Value-added Bandwidth	_____	_____	_____
IBM			
Applications	_____	_____	_____
Enhanced Services	_____	_____	_____
Value-added Bandwidth	_____	_____	_____



Infonet

Applications _____

Enhanced Services _____

Value-added Bandwidth _____

[U.S. Respondents:]

Regional Telcos (as a
group)

Applications _____

Enhanced Services _____

Value-added Bandwidth _____

[Other Respondents:]

Your national telecom
carrier

Applications _____

Enhanced Services _____

Value-added Bandwidth _____

12. What advice would you give to a vendor that was
planning to offer new or expanded services in these areas?



EXHIBIT-1

Levels of Communication Services

3	Network-Based Applications (Examples)	Electronic Mail (within an enterprise) Electronic Mail (between enterprises) Employee Locator (on-line) Electronic Data Interchange (EDI)							
2	Enhanced Communications Services (Examples)	OSI	TCP/ IP	DEC Net	SNA	Packet Switching	Frame Relay	Bulk Data Transfer	Video
1b	Value-added bandwidth (examples) <ul style="list-style-type: none">Expedited deliveryQuickly adjustable bandwidthDefined performance levelsCross-border service								
1a	Pure bandwidth (e.g., tariffed circuits from carriers)								

YNDC2



I N T E R O F F I C E M E M O R A N D U M

at AKO

Doc. No: 007302
Date: 04-Mar-1992 10:17am EST
From: ROB RICH @AKO
RICH.ROB AT AKOV12A1 at AKOMTS
Dept: GIA Telecomm & Tech Support
Tel No: 244-6546/ 508-264-6546

TO: See Below

Subject: (I) Contacts for Input survey

Dave,

Here are the companies for the surveys as requested from Asia and SFR.

Please note that:

We have not received Japan's list yet.

We have given more than the requested number of customers in each country (in case some decline Input's invitation). They are ranked in descending priority.

The contacts are mostly 'household names' in those countries. In Australia, BP means British Petroleum, and BHP means Broken Hill Proprietary. HK Bank is Hong Kong and Shanghai Bank. The rest should be very clear. Hutchison International Terminal is the transportation piece of the Hutchison group... a little caution here.. another Hutchison division is a wireless carrier in HK, so discretion is especially important here.

I will send the Japan prospects as soon as I get them. I hope this is helpful. If it makes sense, the local INPUT people may want to talk briefly with Simon or Allan before contacting the customers.

cheers
rjr

Distribution:

TO: dave cedrone @lkg

CC: yoshikuni kasuya @mjr
CC: allan mason @sno
CC: simon-yk chan @hgo
CC: al albano @geo
CC: susan schweizer @tay



I N T E R O F F I C E M E M O R A N D U M

Date: 03-Mar-1992 08:59pm EST
From: ALLAN MASON
MASON ALLAN AT A1@SNOC01@SNO
Dept: SPR TELECOMMUNICATIONS
Tel No: [61]-2-561-5412

TO: ROB RICH @AKO
O;

(RICH.ROB AT AKOV12A1 at AKOMTS at AK

CC: SIMON-YK CHAN @HGO
CC: YOSHIKUNI KASUYA @TKO
CC: ALLAN MASON @SNO

Subject: RE: (U) Prospect contacts for Network survey

Rob,

Here are some SPR names for you.

Thorn EMI
BP
Shell
BHP
Alcoa
Citibank

Regards,
Allan



I N T E R O F F I C E M E M O R A N D U M

at HGO

Date: 04-Mar-1992 04:50am EST
From: SIMON-YK CHAN @HGO
SIMON-YK CHAN AT A1 at HGOV05
Dept: Asia Telecom & Info Security
Tel No: (852)864-3940

TO: ROB RICH @AKO

(RICH.ROB AT AKOV12A1 at AKOMTS at AK

CC: YOSHIKUNI KASUYA @TKO
CC: ALLAN MASON @SNO

Subject: RE: (U) Prospect contacts for Network survey

Rob,

Contact in order of priorities are:

- HK Bank: Tim Cureton, Mgr Group Network
- CitiBank Singapore
- Dupont Singapore: David Lewis, Regional Network Services-A/P
- Evergreen Taiwan
- Hutchison International Terminal (HIT) Hongkong
- Cathay Pacific Hongkong
- Reuter Singapore

cheers,
SIMON



Table 4. Taking the Lead in Network Technology

Country	Digital Service in Public Networks in 1990 (%)			
	Transmission	Local Switching	Long-distance Switching	Investment in Public Network in 1987 (US\$ per capita)
U.K.	100	42	90	48.6
Netherlands	95	35	15	35.3
Denmark	85	23	40	57.6
France	70	70	75	73.7
Ireland	70	65	85	37.2
Belgium	50	29	75	39.4
Sweden	50	33	50	75.6
West Germany	50	10	22	118.8
Italy	45	25	36	41.0
Portugal	70	20	20	4.1
Spain	47	5	45	19.7
Luxembourg	35	8	10	24.5
Greece	30	8	40	1.3

Table 6. Quality of X.25 Services

Call From:	Total Number of Calls	Int'l Calls (% of total)	Failures (%)
West Germany	175	56	8.0
Netherlands	929	85	9.3
Sweden	1,218	73	10.0
France	777	34	11.7
Austria	345	100	11.9
Norway	790	81	13.9
Luxembourg	57	96	15.8
Switzerland	131	75	16.0
Belgium	265	92	18.1
Finland	800	85	16.6
Denmark	123	98	19.5
U.K.	1,427	91	24.7
Italy	588	71	26.0
Spain	959	92	30.5
Ireland	65	100	32.3
Greece	15	100	33.3
Portugal	35	94	62.9

(1) Failures blamed on telecommunications equipment.

Source: Derived from the Euclid Survey of Public Data Networks in Europe 1988. Euclid is the European Association of Information Services (Caime, Wiltshire, U.K.).

By far the worst X.25 network is Portugal's with a 62.9 percent failure rate of calls. Spain, Ireland, and Greece also drew very poor ratings, below 30 percent.

Some have challenged these findings. Researchers at the Inter-university Institute for High Energies at Brussels Universities questioned Euclid's 1987 survey, claiming that the majority of Belgian failures were caused by users or database providers and not by the PTT.

Nevertheless, EUSIDC's methodology was developed with help from some PTT's, notably

SITA says the quality below its target of 99, lent to 3.5 hours of downtime April 1990, only 62 percent met this target, and it then dropped as low as a satisfied with the overall.

Another often-heard not sensitive to 24-hour not available outside their country, even though lines spanning different Major network (vice as a key issue in emphasis varies. In R second deterioration of customers, quality of without regard to cost in its store-and-forwardly go unnoticed by a Poor quality of because more backup an awful lot of money Cornish. He says PTT providing this network no failures, we would which would lower still an attitude among should be grateful that for most of the time, a

References

1. See "Let Freedom Ring: Data Communications Into



Table 5. Where to Go for Fastest Product Approvals

Delay in Days					
Supplier Estimate		Official Estimates		Percent of Applications Rejected	
Country	1988	1988	1983	1983	1988
Japan	61	25	60	0	2.1
Austria	76	120	120	0.4	2.0
New Zealand	88	-	14	0	28.9
Canada	89	49	-	1.9	-
U.S.	94	-	49	-	0
Sweden	98	28	60	0	0
Spain	100	-	-	-	-
Italy	103	0	0	0	3.7
Finland	111	105	120	0	1.3
Austria	111	98	35	0.4	2.0
Switzerland	114	75	-	16.7	-
Belgium	116	135	135	3.5	0
Norway	118	154	49	16.7	31.0
Portugal	119	-	270	-	9.1
U.K.	131	-	90	-	39.7
Ireland	134	105	-	0	-
West Germany	135	105	180	5.0	3.2
Denmark	136	10	-	2.2	-
Netherlands	140	40	75	6.7	48.0
France	149	140	365	5.2	48.0

Source: Unpublished survey done in January 1990 by OECD, Paris.

MIT40-200-706
ManagementWhere to Hub
Pan-European
NetworksDatapro Management of
International Telecommunications**Table 3. Leaders in Leased-line Freedoms**

Country	Interconnects with Public Networks	Interconnects with Public Networks	Carries Third Party Traffic	Capacity	Capacity
	Domestic	International		Sharing	Resale
U.S.	Yes	Yes	Yes	Yes	Yes
U.K.	Conditional	Conditional	Yes	Yes	Yes
Japan	Conditional	Conditional	Yes	Yes	Yes
Canada	Conditional	Conditional	Conditional	Conditional	Conditional
Finland	Conditional	Conditional	Conditional	Conditional	Conditional
France	Conditional	Conditional	Conditional	No	No
Belgium	Conditional	Conditional	Conditional	No	No
Netherlands	Conditional	Conditional	Conditional	No	No
New Zealand	Conditional	Conditional	No	No	No
Norway	Conditional	Conditional	No	No	No
Sweden	Conditional	Conditional	Conditional	No	No
Turkey	Conditional	Conditional	Conditional	No	No
Austria	Conditional	Conditional	No	No	No
Switzerland	Conditional	Conditional	No	No	No
Denmark	Conditional	No	Conditional	No	No
Iceland	Conditional	No	Conditional	No	No
Greece	No	No	Conditional	Conditional	No



Tom

Enclosed Service
descriptions for your
reference & preparation
for next weeks meeting,

I hope this helps

Dave.



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I N T E R O F F I C E M E M O R A N D U M

Doc. No: 007157
Date: 25-Feb-1992 04:45pm EST
From: David Cedrone
CEDRONE.DAVID
Dept: Corporate Telecommunication/IT
Tel No: 508-952-3916

MS

TO: Paul Speak

(SPEEK.PAUL AT A1_CTHQ3@LKGMTS@TAY)

Subject: RE: (Q) Do the first parts of this program plan describe it ?

No, sorry.

I'm looking for a description of what the end customer would get as a service. I'll send you a copy of the service description I have in the Handbook, although this was really targeted at TDM enhanced private line services. I was wondering if there is some similar description of Fast Packet services?

International Transmission

Network Services

Handbook

2.0 Transmission Services

Include:

Consulting Services

Planning
Design
Implementation
Management



Transmission Solutions

Enhanced Transmission Network Services for Voice, Data, and Video networks.

Transmission Network Components

4.0 Portfolio of Services

The ITMS/C portfolio of Transmission Services is depicted in Figure 1.

Consulting Services are provided to Sales Teams in support of pre-sales activities, can be sold by Sales Teams as a service to Customers, and are provided to internal Information Systems or Network Services managers for Voice, Data, and Video network applications.

These services generally result in the provisioning of a Transmission Network Solution based on Digital's Enhanced Transmission Network service, the Integrated Digital Network (IDN), and/or based on vendor supplied Transmission Components (private lines, circuit or packet switched services and transmission equipment).

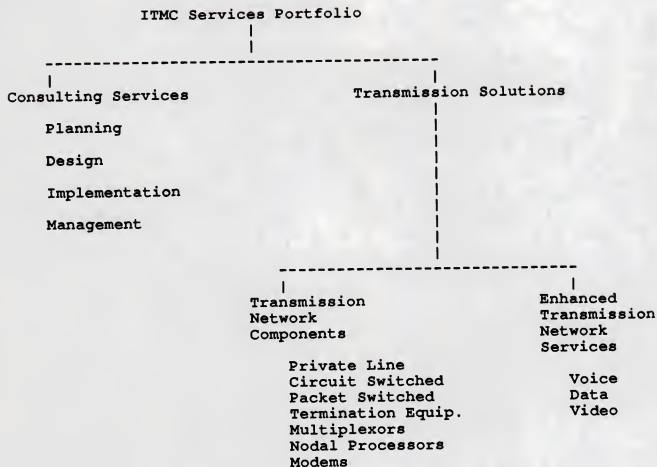
Enhanced Transmission Network Services are based on DIGITAL's private Integrated Digital Network (IDN). The IDN network provides a transmission server interface for Voice, Data and Video network requirements. Currently, the server interface provides enhanced quality private line services. *when?* In the future, the transmission server interface (Note 1) will allow the routing of traffic over public circuit and packet switched services based on optimized service level and cost routing algorithms.

Note 1 - Reference the Integrated Telecommunications Technical Architecture for further description of the Transmission Server.

Transmission Components are provided by Transmission Service Provider's (TSP's) i.e. licensed infrastructure carriers (RBOC's/PTT's) and Value Added Network carriers. Transmission equipment is provided by Telecommunications Equipment Manufacturers (TEM's). ITMS/C will plan, design, implement and manage a network, on behalf of a Customer, based on the optimum combination of Transmission Components that meets the customers requirements.



Figure 1.





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I N T E R O F F I C E M E M O R A N D U M

Doc. No: 007164
Date: 25-Feb-1992 09:11pm EST
From: Bob Igou @TAY
IGOU.BOB
Dept: Network Applications Services
Tel No: DTN 227-3936

TO: David Cedrone

(CEDRONE.DAVID)

Subject: RE: Meeting with INPUT - March 4th

Dave,

Attached is a summary document being written for service level agreements. It is probably the best description of the services we have.

Regards,

Bob



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I N T E R O F F I C E M E M O R A N D U M

Date: 08-Jan-1992 01:19pm EST
From: Jim Deluco @TAY
DELUCO.JAMES
Dept: Network Applications
Tel No: 227-3959

TO: See Below

Subject: Network Applications Service Levels

**Network Applications
Service Levels
Status Effective January 8, 1992**

Business decision usage for metrics (applies to all Network Applications Businesses below):

Traffic Information - Used for resource allocation. This includes decisions regarding the placement of human and system resources in support of the service.

Performance Information - Used for the allocation of support resources; input for point product enhancements; decisions on replacement and migration of products; service scaling decisions (ie, expanding EDI trading partners).

General Usage - The collection of both traffic and performance metrics can also be used in benchmarking and in support of the sale of Digital products and services.

Message Transport Service

Type of Service:

Electronic Mail Utility

Service Description:

Electronic mail transfer between mail user agents such as ALL-IN-1 Integrated Office System, ALL-IN-1 MAIL, VMSmail.

Service Features:

Ability to exchange mail between Digital Employees via local mail user agents.

Ability to direct inbound mail to users' preferred user agent or to a printer for hardcopy delivery.



Complementary Support Services:

Local Message Router administration.

Corporate topology administration.

Consulting and site visits for special problems.

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
Delivered within 90 minutes	95%	93%
Delivered within 24 hours	100%	100%
Delivered intra-cluster within 20 minutes	90%	80%
Message Rejections (legitimate addresses)	.001%	N/A
Messages Lost	.0001%	N/A

Approximately 4 million messages per month delivered

Reported Monthly

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):

These measurements will be implemented with Metrics V3.0, June 9, 1992



VTX Utility

Type of Service:

Reference information access utility.

Service Description:

Infrastructure service for access to VTX-based information.

Service Features:

Consistent and reliable access to all VTX-based information in Digital from any end user system.

Keyword-only access for pilot applications.

Distributed menu services for distributed applications.

Location-dependent access for replicated applications.

Complementary Support Services:

Local site/area services providing a corporate menu.

Online registrations for infobases.

Weekly updated corporate menu.

Consulting for special access problems.

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
Avg Time to deliver page to the user	* 5 sec.	N/A
Availability	99%	N/A

* Five seconds is an industry expectation for the maximum time it should take to return a videotex screen in response to a request for the next screen. Since we do not currently measure this, it is unclear what our expectation should be of the internal service.

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):

Defined in VTX Metrics project, scheduled to being July, 1992





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X.400 Gateway Service

Type of Service:

Inter-company electronic mail transfer via X.400 protocol.

Service Description:

Electronic mail transfer between Digital employees and Digital trading partners.

Service Features:

Standardized addressing of electronic mail to accounts of Digital trading partners.

Electronic mail transfer from accounts outside of Digital.

Complementary Support Services:

Gateway support services for inter-company message routing.

Directory query for X.400 addresses of registered Digital users.

Availability:

Today

Service Levels:

Criteria	Metric	
	Goal	Actual
Avg Message Delivery Time to Recipient's ADMD gateway	10 min.	20 min.
Message Rejections with Legitimate Addresses from Digital mailbox to ADMD Gateway	.001%	N/A
Messages Lost from Digital mailbox to ADMD gateway	.0001%	N/A
Approximately 35,000 messages per month Reported Monthly		

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):

Metrics V3.0, June, 1992



digital

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DECnet Naming Services (DECdns)

Type of Service:

Name translation facility running on DECnet

Service Description:

Provision of name translation service to any Digital user or application running on DECnet.

Service Features:

Provides client applications with a "name" to address translation facility.

Maintained in replicated directories which are automatically updated.

Complementary Support Services:

Distributed server management

Central name table administration

Digital Node Registration system

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
% Root server availability	N/A	N/A
% Field Server availability	N/A	N/A
% Site directory updates w/in 12 hrs	N/A	N/A
% Site directory updates w/in 24 hrs	N/A	N/A
Response time to client to server to client	N/A	N/A
Avg problem resolution turn around	N/A	N/A

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):



digital

DIGITAL CONFIDENTIAL

TCP/IP Naming Services (Bind)

Type of Service:

Host name translation facility running on IP

Service Description:

Provision of host name translation service to any Ultrix-based Digital user or application running on TCP/IP.

Service Features:

Provides host based "resolvers" with a "host name" to address translation.

Name to address information is maintained in flat files on primary and secondary domain servers. Secondary domain servers are updated by primary servers via zone transfers.

Complementary Support Services:

Distributed server management

Central name table administration

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
% Dec.com Server Availability	N/A	N/A
% Site.dec.com server availability	N/A	N/A
Hr Avg problem resolution turn around	N/A	N/A
M:S Avg response time from resolver to server to client	N/A	N/A

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):



digital

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**Employee Locator Facility
(ELF)**

Type of Service:

Employee information retrieval

Service Description:

Provides addressing and organization information about employees.

Service Features:

Ability to look up information about employees by name, site code, etc.

Employees can modify some of their own information online.

Resolved to Employee Master Files.

Automated replication to distributed servers.

Complementary Support Services:

Distributed server management.

Centralized transaction processing and routing.

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
Avg availability	99%	N/A
Avg time to execute simple searches	10 sec	N/A
Average connects per server/month	N/A	N/A
Avg time to propagate user-defined updates	48 hrs	N/A
Avg time to propagate feeds from EMF's	N/A	N/A

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):



digital

DIGITAL CONFIDENTIAL

FAX

Type of Service: FAX Exchange

Service Description:

Send text or image FAX from any mail user agent in Digital to any FAX address.

Service Features:

Automated routing.

Complimentary Support Services:

Availability:

Q1/FY93

Service Levels:

Criteria	Metric	
	Goal	Actual
Avg FAX delivery times	N/A	N/A
Avg Availability	N/A	N/A

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):



Time Service

Type of Service:

Time Synchronization

Service Description:

World-wide synchronization of time on all Digital computers.

Service Features:

Fast and Highly dependable time provision

Automated server synchronizations

Complimentary Support Services:

Central administration of server and time provider locations

Distributed server and client management

Availability:

Q3/FY92

Service Levels:

Criteria	Metric	
	Goal	Actual
Time drift	20 sec.	N/A
Number of connects per server	N/A	N/A

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):

Working with DECdts Product Development for inclusion in product. Expected to be delivered @Q3/FY92.

Distribution:

TO: Robert J. Costigan @TAY	(COSTIGAN.BOB)
TO: Jim Metzler @TAY	(METZLER.JIM)
TO: Remote Addressee	(JOHN REGAN AT MKO)
TO: Remote Addressee	(GABRIEL BARTA AT GEO)
TO: Remote Addressee	(BERTRAND BUCLIN AT GEO)

Use the RDL option to see remainder of distribution lists.



Open Systems Networks
Service Level Status
United States Data Networks Backbone - DECnet IV

January 22, 1992

~~SECRET~~

DIGITAL CONFIDENTIAL

Type of Service

Connectivity to Geography DECnet Phase IV Networks

Service Description:

Connection service for all intra US Geography DECnet Phase IV communications.

Service Features:

Ability to reliably communicate between computer systems located in the US geography across Digital via geography networks interconnected to the US Data Network Backbone - DECnet IV.

Low latency across the backbone to support time sensitive communication.

High throughput across the backbone to support data transfer.

Responsiveness to accomodate changes in business requirements.

Complementary Support Services:

Regional or sub-regional level networks, management and operations.

Consulting for special problems.

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
Connectivity to each US geography domain	99.9%	N/A
Connectivity among all US geography domains	99.1%	N/A
Average latency of 330 ms across US backbone	97.0%	N/A
Capacity to transfer 1 million pages/hour	97.0%	N/A
Response to service requests satisfied	99.0%	N/A
Connectivity to Europe	99.5%	N/A
Connectivity to GIA Regions	99.5%	N/A

To Be Reported Monthly

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):

To be addressed in the DNMG Back to Basics Program.

Latency is being measured and reported today, however metric of this



Open Systems Networks
Service Level Status
United States Data Networks Backbone - DECnet IV

January 22, 1992

being met 97% of the time is not.



Open Systems Networks
Service Level Status
Digital Data Networks Backbone - TCP/IP

January 22, 1992

digital

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Type of Service

Connectivity to Geography TCP/IP Distribution Networks

Service Description:

Connection service for all inter Geography TCP/IP Distribution Network communications and for intra Geography TCP/IP Distribution Network communications where requested.

Service Features:

Ability to reliably communicate between computer systems located in the geographies across Digital via geography TCP/IP distribution networks interconnected to the Digital Data Network Backbone - TCP/IP.

Low latency across the backbone to support time sensitive communication.

High throughput across the backbone to support data transfer.

Responsiveness to accomodate changes in business requirements.

Complementary Support Services:

Geography level backbones, management and operations.

Regional or Country level networks, management and operations.

Consulting for special problems.

Availability:

Now

Service Levels:

Criteria	Metric	
	Goal	Actual
Connectivity to each geography domain	98.0%	N/A
Connectivity among all geography domains	82.0%	N/A
Average latency of 330 ms across backbone	97.0%	N/A
Capacity to transfer 330 thousand pages/hour	97.0%	N/A
Response to service requests satisfied	99.0%	N/A
Connectivity to Internet via CRANet	nn.n%	N/A

Approximately nnn billion bytes per month delivered

To Be Reported Monthly

Plans for Reporting of Metrics not Yet Reported (listed as "N/A" above):



digital

DIGITAL CONFIDENTIAL

SERVICE DESCRIPTION

TITLE

VIDEOCONFERENCING SERVICES

INTRODUCTION

Over the last year, videoconferencing has emerged as an effective face-to-face communication tool while simultaneously avoiding the high cost of travel and risks of political unrest. The growth of videoconferencing usage is expected to continue through the 1990's as an alternative method of cost effective meeting and global teaming.

According to the consulting and market research firm Telemanagement Resources International INC. (TRI), worldwide revenue for videoconferencing equipment and services will grow from \$510 million in 1991 to \$1.5 billion in 1995.

AT&T and U.S. Sprint have responded by building, or contracting for, public and private rooms from which to videoconference. These are located in highly trafficked metropolitan areas. The price for using these facilities range from \$200 - \$400 per hour for the room and \$180 - \$1000 per hour for transmission charges. The services also charge administration fees and additional monies for setups and use of multi-point conferences.

Digital is in the processing of implementing a worldwide videoconferencing program internally. Coupling their implementation learning experience with their extensive network knowledge, Digital is in a prime position to command a sizable portion of the videoconferencing consulting revenue.

As the price of videoconferencing hardware keeps falling, owners and users will become more sensitive to the variable costs, mainly in the area of telecommunications. This allows Digital to provide services at many levels:

Overview Consulting Service

This is a short-term consulting where Digital can showcase their internal videoconferencing system, review their experience with the customer as well as look at the client's proposed solution.

Detailed Consulting Service

The full consultation service can include analysis, design and/or implementation of a videoconferencing system or various components. Digital can also provide full consultation in the area of videoconferencing equipment selection. Consultation services can be provided to customers and cover part or all of the components of a videoconferencing program including:



1. Analysis of the customers needs and recommendation of a strategic solution to the customer
2. Provide business justification of a videoconferencing system consulting service to customer in order for the customer to "sell" videoconferencing to their management.
3. Design of the network, switching and scheduling
4. Selection of hardware and software including:
 - o videoconferencing equipment (cameras, monitors, etc)
 - o codecs
 - o network devices
 - o scheduling software
 - o network management software.

Implementation Service

Through O.E.M. agreements with various videoconferencing and network device equipment manufacturers as well as application software developers, Digital can offer a full or partial videoconferencing turnkey system within the customer's sites.

Administration Service

Digital can also provide full administrative services to customer's videoconferencing system and network including:

1. Room reservation
2. Conference scheduling
3. Addition, removal and relocation of rooms and equipment
4. Circuit administration
5. Billing.
6. Marketing of videoconferencing to customer's internal population.

CUSTOMER INVOLVEMENT

Typically, the customer team, in addition to the Digital consultant, would consist of four functional experts (finance, business controls, telecommunications and software technical experts), the site telecommunications manager and a videoconference program/project manager (assuming that the customer has such person assigned).

BENEFITS

Customer

The use of videoconferencing technology main benefit to the customer



digital

Digital Equipment Corporation
TAY2-1/B16
153 Taylor Street
Littleton, MA 01460-1407
508.952.3913

David Cedrone
Telecommunications Consultant
International

digital

Digital Equipment Corporation
550 King Street, LKGT-2/W12
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508-486-9062

Taylor Rd
508 952 3916

Oxford

ESSELTE

Frederic Kunzi
Manager
International Transmission

digital

Digital Equipment Corporation
153 Taylor Street TAY2-1/B16
Littleton, MA 01460-1407
X.400:C = us;A = mci;P = digital;
O = digital;OU = tay, Telex 4430127
508.952.3930 FAX 508.952.3023

NO. 752 1/3

Cheryl North
res-603-472-7139

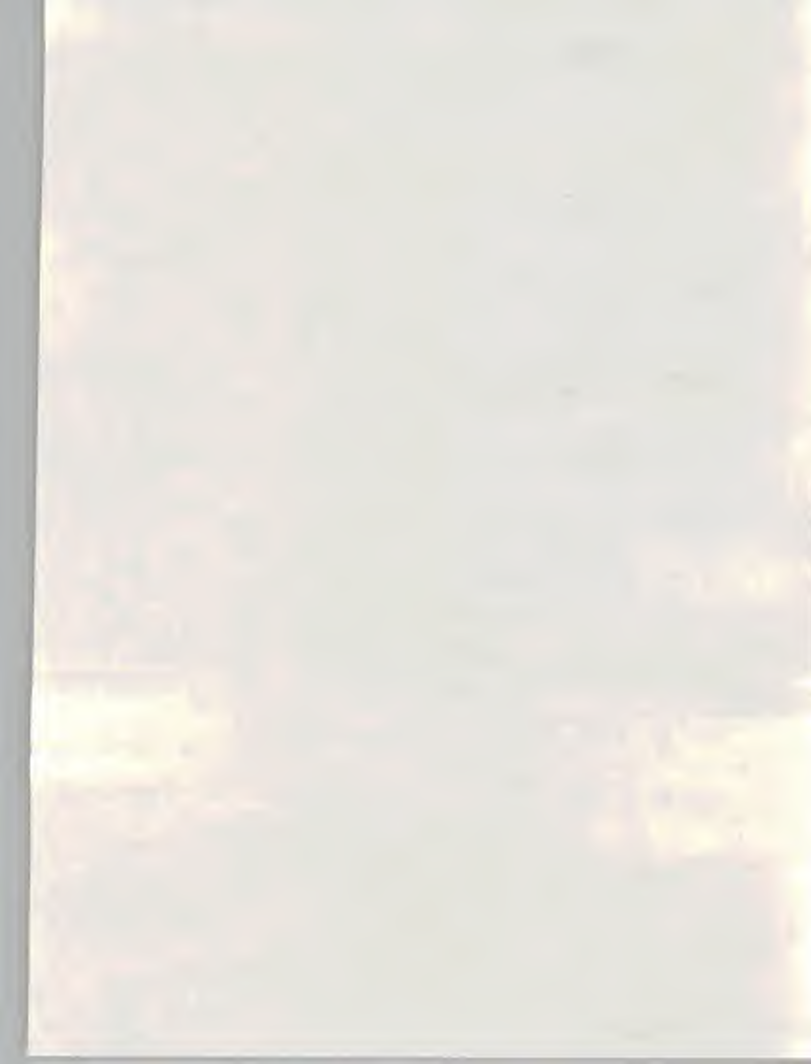
Wachaus 603-726-9824 For Set

for
tel 603-884 3195
603-884-1068 P!

VM 715
723

→ For 508 952 3023 → talk to

M-R



**News
Release**

For more information contact:

Infonet
2100 East Grand Avenue
El Segundo, CA 90245
C. Randles Lintecum (310)335-2860

Prepared by: Pat Gale (310)335-2877

FOR IMMEDIATE RELEASE

infonet

Infonet Extends its Global Network to Taiwan

EL SEGUNDO, Calif. -- February 25, 1992 -- Infonet announced today that it is extending its worldwide communications network to Taiwan. As a result, Infonet is the first global network provider to establish a fully operational communications facility in Taipei.

Taiwan's business community can now gain direct access to Infonet's network for worldwide data, E-mail, store and forward, fax and telex transmissions to more than 118 countries.

"Our new Taipei communications facility brings us one step closer to achieving our ultimate goal of a fully redundant mesh network in Asia that gives users greater reliability than star network topologies," said Theodore T. Iriye, Infonet's vice president of the Asia-Pacific.

Infonet already has direct access communication facilities in Hong Kong, Japan, Korea, the Philippines, Singapore and Australia, along with gateways to Indonesia, Macao, Malaysia, Thailand and mainland China.

Meanwhile, plans are under way to interconnect the Infonet network with Taiwan's PACNET national public data network. PACNET subscribers may then access the Infonet network by making a local phone call from Kaohsiung, Taichung, Tainan, Taipei, Keelung, Hsinchu and other major cities in Taiwan.

The China Data Processing Center will maintain the Infonet communications facility, which is located on the premises of the Data Communications Institute (DCI) in

(More)

THE
JOURNAL OF THE
ROYAL ANTHROPOLOGICAL INSTITUTE
OF GREAT BRITAIN AND IRELAND
PUBLISHED BY THE
CAMBRIDGE UNIVERSITY PRESS
1904

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1904

Taipei. Communication specialists at the China Data Processing Center will connect local businesses to Infonet's network and NOTICE 400 messaging service and install NOTICE 400 PC E-mail software at their sites. These professionals will make the necessary arrangements for users to access the Infonet network via PACNET as well.

"Numerous high-tech computer firms in the Hsinchu industrial park are eager to establish Infonet network connections with their electronic component suppliers in the U.S.," said Kevin C.W. Liao, president of the China Data Processing Center. "Other manufacturers in the aerospace industrial zone at Taichung are equally anxious to communicate with their customers in the U.S. and Europe via the Infonet network."

The China Data Processing Center will hold on-site education and training classes introducing users to their new Infonet technology and provide ongoing service and support, complete with a telephone hot line staffed by senior technical experts in Taipei.

Established in 1970, Infonet is the leading standards-based international value-added network services company. It provides and directly supports communication and computer services worldwide. All told, Infonet serves more than 10,000 user sites throughout the world. The company is jointly owned by 11 major telecommunication administrations in Europe, the U.S. and Asia-Pacific.

Further information on Infonet products and services is available by calling Infonet at (310)335-2860 in the U.S. or the China Data Processing Center at (886) (2) 3953837 in Taiwan.

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**News
Release**

For more information contact:

Infonet
2100 East Grand Avenue
El Segundo, CA 90245
C. Randles Lintecum (310)335-2860

Prepared by: Pat Gale (310)335-2877

FOR IMMEDIATE RELEASE

infonet

**ATTIS to Market Infonet Communication Services
in Mexico and Support Local Users**

EL SEGUNDO, Calif. -- February 18, 1992 -- Infonet announced today that ATTIS de Mexico S.A. will market and sell the firm's international value-added network services in Mexico and support local users. The Infonet network is currently accessible in more than 118 countries for worldwide data, E-mail, store and forward, electronic data interchange, fax and telex transmissions.

ATTIS is a Mexican company closely associated with ATTIS Europe, which specializes in the design and creation of information systems and is renowned for its international videotex developments. Infonet also has an agreement with Telecomunicaciones de Mexico, which is responsible for upgrading and expanding Infonet's worldwide network in Mexico.

"As a result, we now have one organization solely committed to Infonet user support in Mexico and another organization completely dedicated to network expansion," said Juan Cenzano, director of Infonet's Iberoamerica region. "This approach allows us to more aggressively strengthen Infonet's global communication services in Mexico. We will then be well-equipped to accommodate increased traffic demands once Mexico joins the North America Free Trade Area (NAFTA) already formed by the U.S. and Canada."

Telecomunicaciones de Mexico currently maintains Infonet communication facilities in Cancun, Guadalajara, Hermosillo, Mexico City and Monterrey. According to Cenzano, Telecomunicaciones de Mexico will open Infonet communication facilities in several more Mexican cities during the next two years.

(More)



Infonet operates an interconnect with Mexico's TELEPAC national public data network, too. TELEPAC subscribers may gain access to the Infonet network from more than 50 Mexican cities by making a local phone call.

Meanwhile, the Mexican government is rapidly privatizing the national telephone company, Telefonos de Mexico S.A. (TelMex). TelMex is in turn making serious efforts to establish a digital network system. Upon completion, the network will allow large commercial users to transmit data at up to 2 Mbps across fully digital connections, thereby greatly improving the quality of data communication services in Mexico.

The communication specialists at ATTIS de Mexico will make the necessary arrangements for multinational users in Mexico to access the Infonet network via TELEPAC. These professionals will connect new customers directly to Infonet's worldwide network and NOTICE 400 messaging service and install NOTICE 400 PC E-mail software at their sites as well.

"We are receiving numerous requests for Infonet service from U.S. electronics and garment manufacturers," said ATTIS Director General Rodolfo Sandoval. "Eager to leverage labor and transportation cost advantages, many of those firms are now relocating the labor-intensive factory operations they established in the Asia-Pacific during the 80s to Mexico. Other key Infonet clients are Asian businesses who are investing heavily in Mexico as a means of penetrating the U.S. market under the highly favorable terms of the North America Free Trade Area agreement that's being negotiated."

ATTIS will also hold on-site education and training classes introducing users to their new Infonet technology and provide ongoing service and support, complete with a telephone hot line staffed by senior technical experts in Mexico City.

(More)

the program, and the program's impact on the students' learning.

The program's impact on the students' learning was measured by the students' scores on the final exam. The final exam was a multiple-choice test that covered the entire course content.

The results of the final exam showed that the students who participated in the program scored significantly higher than the students who did not participate in the program.

The program's impact on the students' learning was also measured by the students' scores on the final exam.

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Further information on Infonet products and services is available by calling Infonet at (310)335-2860 in the U.S. or ATTIS de Mexico at (52) (55) 45-7150 in Mexico City.

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#

#



INPUT

CONFIDENTIAL—Property of INPUT

CONTACT REPORT

Contact Date: 2, 27, 92

INPUT

Staff: Init.

TOR

Init.

☐ INPUT office

☐ Client Office

☐ Other

Date Written:

3 1 2 1

Company	DEC	DISTRIBUTION:			Prog./Proj. ID
Name	Dave Cedrone	Action	Info.	By When	Describe Action-F/U
Title		TOR	PAC	*	mtg 5:30/4,
Address					week of 3/4,
Phone: (508) 952 - 3816					4/3
Fax: () -					Please advise if you want to attend 4/3 mtg

Dave is liaison on DEC Data Communication market study

- P.O. to be issued by 3/2
- Kick off mtg 3/4
 - Review questionnaire draft
 - Review targets
 - Brief INPUT on svc offerings
 - Review svc generally
- Probable following mtg following week to reach closure & then begin interview

- Presentation of interim results in Rochester NY April 3

- TOR to present
- PAC is welcome to attend (+ is on tentative agenda)

* PAC: Please advise if you want to attend. Would be good from client continuity standpoint, but not critical

☐ Continued over



Atrium at Glenpointe, 400 Frank W. Burr Blvd., Teaneck, NJ 07666 (201) 801-0050
Fax (201) 801-0441

FAX TRANSMITTAL FORM

Date: June 5
To: Name: Peter Liner
Tel./Location: _____
Co.: _____
Fax No: _____
From: Tom O'Flaherty
Subject: YNOC2

Confidential: Y/N
Urgent: Y/N

Page: 1 of 1

File: Chron
Contact
Other:

- Although results were unpalatable DEC found study quite effective & has asked for follow-on recommendation - Thanks to all
- They want to pay our bill. Please send telephone, etc expense to me as soon as you can. Besides the consultant's direct phone costs, include a reasonable amount for our consultation & other expense.



ORDER/INVOICE/FULFILLMENT

Acctg. ONLY	Inv. Comp.	By:	Date:	Client #	Order #	Inv. #	Multi-Invoicing of	
	ORIGINATOR (Signature) <u>[Signature]</u> DATE <u>Mar 6 1992</u>							
CUSTOMER/INVOICE TO	Company	Digital Equipment				CA Tax Rate	APPROVALS VP Sales/Res. Date Controller Date	
	Name Mr./Ms.	David Cedrone				CT Tax 8%		
	Position	Telecomm Consultant				Salutation		
	Address	153 Taylor St				State		
					Zip	01460		
	City	Littleton MA				Country		
	Province					Fax	508-952-3023	
	Phone	508-952-3916				Tlx		
Special instructions for invoicing, progress billing, or delayed payments, etc. <u>Bill N (825,000) now</u>								
ORDER	Contract Year Beg. _____ End _____		Invoice Type <input type="checkbox"/> Fulfillment Only <input type="checkbox"/> W/Order (OR) <input type="checkbox"/> Monthly (MO) <input type="checkbox"/> Quarterly (QT) <input type="checkbox"/> Pending		Employee # Sold by: <u>PAC</u> <u>50%</u> <u>TA</u> <u>50%</u>		Employee # Commission to: _____ %	
	<input type="checkbox"/> New Order (N1) <input type="checkbox"/> Prior Yr (N3) <input type="checkbox"/> Renewal (N2) <input type="checkbox"/> Cancel							
CLIENT AUTH.	PO# <u>TV 829622</u>				INPUT Contract <input type="checkbox"/> Letter <input type="checkbox"/> Verbal <input type="checkbox"/>			
	Attach all authorizing documents to white (contract) copy. to follow							
SHIP TO	Company		Province					
	Name Mr./Ms.		Salutation					
	Position		State					
	Address		Zip					
			Country					
	City		Phone					
ITEM TYPE	• Subscription (SB) • Custom (YC/ZC/KC)VC • Multiclient (MC) • Reports (RP)		• Copies (CP) • Consult/Present (PR) • Newsletter (NL) • Reimbursed Costs (EX)		• Merger/Acq. (ME) • Exec Overview (EO) • Conf/Seminar (CN)			
DETAIL	Indicate US, UK, FR, VA	Prod. ID/Year	Item Type Code	Item Description or Title	Quantity	Price	Shipped By	Date
	US	YNDC.2	YC	Worldwide Communication Market Study	1	850,000		
				+ 85K expenses				
Fulfillment to be completed in: <input type="checkbox"/> Corporate <input type="checkbox"/> London <input type="checkbox"/> Virginia <input type="checkbox"/> France <input type="checkbox"/> Other								

• White - Contract • Green - Fulfillment • Yellow - Invoice • Pink - Originator • Goldenrod - Sales Manager

M&S 180 8/89

INPUT



CONTACT REPORT

INPUT

Staff: Init. PNC Init. ☐ INPUT office ☐ Client Office ☒ Other EDSContact Date: 2, 27, 71Date Written: 2/27/91

Company	<u>DIGITAL</u>			DISTRIBUTION:	Prog./Proj. ID
Name	<u>CHERYL NORTON</u>	Action	Info.	By When	Describe Action-F/U
Title	<u>PETER BROSN.</u>		<u>Tom</u>	<u> </u>	<u>late.</u>
Address					
Phone: ()					
Fax: ()					

- Conference call.
- Peter asked my opinion on reasons for them to do in network business. I told him Digital had 'lucked into' a reputation for network - they should not lose it. BUT don't compete in the commodity area - compete in value service. Emphasize global reach.
- Cheryl gave example of Buxter connecting to hospitals as a competitor in value area (but also a potential client for Digital). Highly profitable business for Buxter.
- Peter also asked about outsourcing of data center and networks.
- I pointed out Digital needs to deal outside IS area with line managers who are replacing CIOs.
- Cheryl will arrange conference call at end of March.
- Cheryl thought they had agreed to move forward with our proposal last week.



1953 Gallow's Road, Ste. 560, Vienna, VA 22182 (703) 847-6870
Fax (703) 847-6872

Date: 1/23/92
To: Name: Tom O'Flaherty
Tel./Location: 201-801-0441
Co.: D.J.
Fax No: _____

Urgent: Y / N

From: Lt. C.

Subject: _____

Page: 1 of 21

File: CHRON
CONTACT
OTHER:

Peter,

Per your, my and Susan's discussion.

Shorter document is part of discussion based on last Friday's conversation. Typed parts are Susan's, mine are handwritten.

Longer document, what we need in the business plan document.

Combined with the content guide they equal what should appear in the business plan.

Will see you Thursday night.

Cheryl

Dictated But Not Read



* Recommended Following PIMA BUSINESS / MARKET PLAN FORMAT / MODEL

* BUSINESS ANALYSIS QUESTIONS
3rd Party Consultant Questions

Service Description: (more description available)

- I. Providing the brokerage or ^{Quid/Pro} direct delivery of global transmission services
- II. Providing the delivery of certain value added services on top of the transmission services; e.g. mail, videotext, file transfer. While DECnet Phase IV and TCP/IP support is possible today, DECnet Phase V/OSI will be possible within a year. Would offering a Phase V public service be of sufficient value?

For the identified service descriptions, outline:

- A. Can the above services be differentiated from existing services?
Can " " " be differentiated -> need top 3 mkt players and competitors.
- B. The market opportunity, as broken down by:

- MARKET ANALYSIS**
- Europe *BY NATION*
 - 1) GEOGRAPHY / CROSS-GEOPOLITIC
 - US *TELE*
 - 2) INDUSTRY OPPORTUNITIES (REGULATIONS - SEE # C above)
 - GIA *IND*
 - 3) COMPANY SIZES - OPPORTUNITIES BY \$ STATES BARBERS
 - Between geographies *OTHER*

Characteristics of the market analysis should include:

- Size of the market 1992 - 1997
- position DEC relative to the major competitors of today and tomorrow
traditional 2) non-traditional 3) emerging competitors
- Service features offered by today's competitors as well as thoughts on future functionality; e.g. accounting, security, protocol support.

B. Barriers to Entry

Describe the major barriers *hurdles & costs* to DEC entering this market and what is the cost and impact of exiting the market.

C. User Expectations

Describe the expectations DEC would have to meet in order to be successful in this business.

CUSTOMER NEEDS & EXPECTATIONS (KNOW-IT-ALL)
 1) DIRECT CUSTOMERS
 2) INDIRECT CUSTOMERS
 3) PRIMARY CUSTOMERS
 4) SECONDARY CUSTOMERS

* D. Pricing

PROFIT MARGIN MODELS PRIMARY IMPORTANCE

List the standard pricing schemes of 3 to 5 of the major competitors in this market. Indicate what type of discount schemes the vendors typically offer their customers.

COMPETITORS include (list 3-5) - INVESTMENT RATES STAFF

FIXED PRICE MODEL MODELS

*including INITIAL/RETENTION (CASH SUBSIDIES) / PLACEMENT / ATTENTION MODELS
SERVICE & OVERHEAD COSTS (PRODUCTS) & PRICING*



2. Rollout Locations

Assuming that DEC wanted to role out this service in a controlled fashion, e.g. in roughly a dozen sites worldwide, what sites should be chosen?

CASES
CONSTRAINTS
BARRIERS

SERVICES (CAPABILITIES)
MARKETING (PROMOTIONS & VARIANCES/UNLIKES)

Need to determine the consultant's background in performing these types of studies.

Flora ^{OTHER} CONSULTANTS

CEO
W/L
INFLUENCE
POLITICAL
REGULATORY
OTHER

Need DIFFERENTIATION FOR DIGITAL

VISION
MISSION
GOALS
STRATEGIES
THEMES

VERSUS COMPETITION



192 SP-45 DIGITAL ELECTRONIC 2

AUTOMATED BUSINESS PLANNING SYSTEM CONTENT GUIDE - PHASE 1

PREFACE

The purpose of this guide is to assist the ~~business~~ in preparation of their Business Plans. The content has been developed with the ~~the~~ Planning Managers and is intended to address the needs of most ~~businesses~~. Each ~~BU~~ should use this guide as a framework and tailor the input to meet the needs of a particular business. Some sections may not apply to your business. Graphs, tables and pictures may be included to supplement text.

The primary audience for the ~~the~~ Business Plan is the ~~the~~ BU internally. The Business Plan should be viewed as a vital tool in the management of the business. Secondly, the audience is the constituencies of the BU including Account Units, Product Creation Units and other functions within the company whose support we depend upon for success. Here the Business Plan becomes a communication vehicle. The third audience is the Executive Committee. The Business Plan addresses all the elements normally covered by an Entrepreneur seeking venture capital.

There are key themes that should be highlighted as an integral part of your Business Objectives, Strategies and Programs. These are:

- PARTNERING STRATEGY

Clearly identify Partners' roles in accomplishing your objectives.

- ENTERPRISE INTEGRATION

EIS should be specifically referenced as being integrated at the Program level.

The new management reporting system (Unique, Augmented, Marketing Services) should also be integrated into your plans.



~~REDACTED~~ BUSINESS PLANNING ~~REDACTED~~ CONTENT GUIDE - PHASE 1

SUMMARY OUTLINE

- ✓ I. EXECUTIVE SUMMARY ✓
- ✓ II. MISSION ✓
- ✓ III. MARKET ANALYSIS (1 page) (1 page) (key)
- ✓ IV. BUSINESS OBJECTIVES, STRATEGIES AND PROGRAMS
- ✓ V. FINANCIAL PLANS AND BUSINESS MODELS Competitive + D&C
- ✓ VI. ISSUES/RECOMMENDATIONS Must have, e.g., BUS training
- VII. MANAGEMENT TEAM
- ✓ VIII. INFORMATION FOR PRODUCT CREATION UNITS (Phase 2)
- ✓ IX. INFORMATION FOR ACCOUNT UNITS (Phase 2)
- ✓ X. MANAGEMENT INFORMATION (Phase 2)

* Supersedes 2 page Business Plan Summaries.



BUSINESS PLANNING CONTENT GUIDE - PHASE 1

DETAILED OUTLINE

EXECUTIVE SUMMARY (Supersedes 2 page Business Plan Summaries.)

- A. MISSION HIGHLIGHT SUMMARY
- B. MARKET ANALYSIS HIGHLIGHT SUMMARY
- C. BUSINESS OBJECTIVES, STRATEGIES AND PROGRAMS HIGHLIGHT SUMMARY
- D. FINANCIAL PLANS AND BUSINESS MODELS HIGHLIGHT SUMMARY
- E. ISSUES/RECOMMENDATIONS HIGHLIGHT SUMMARY
- ~~F. MANAGEMENT TEAM HIGHLIGHT SUMMARY~~
- G. INFORMATION FOR PRODUCT CREATION UNITS HIGHLIGHT SUMMARY (Phase 2)
- H. INFORMATION FOR ACCOUNT UNITS HIGHLIGHT SUMMARY (Phase 2)
- I. MANAGEMENT INFORMATION HIGHLIGHT SUMMARY (Phase 2)

II. MISSION

Vision-Cust focused

— One sentence

bus + cust descrip

- A. MISSION STATEMENT
- B. BUSINESS DESCRIPTION
- C. CUSTOMER DESCRIPTION

*eg size
class/level/set of cust
(vary by market)*

III. MARKET ANALYSIS

- A. MARKET DEFINITION
- B. MARKET SIZE/GROWTH AND SHARE
 - 1. Total Market by Geography
 - 2. Target Market by Geography
 - 3. Additional Market Analysis
- C. MARKET TRENDS/CUSTOMER NEEDS
- D. COMPETITIVE POSITION
- E. MARKET ENVIRONMENT
 - 1. Strengths
 - 2. Weaknesses
 - 3. Opportunities
 - 4. Threats

TOP STRATEGIC ACCOUNTS OPPORTUNITIES - Targets

IV. BUSINESS OBJECTIVES, STRATEGIES AND PROGRAMS

- A. BUSINESS OBJECTIVE *
 - 1. Strategy
 - a. Program (Implementation Plan)
 - 2. Strategy
 - 3. Measurement Criteria
 - 4. Risks/Dependencies
 - 5. Revenue

* Include your key Business Objectives that represent a major portion of the ABU's goals. Create Section IV. B, etc. as needed to communicate your key Business Objectives, Strategies and Programs.

V. FINANCIAL PLANS AND BUSINESS MODELS

~~*****~~ BUSINESS PLANNING ~~*****~~ CONTENT GUIDE - PHASE 1

- A. FINANCIAL ~~PROJECTIONS~~**
1. Business Plan - Worldwide
 - a. Total
 - b. Products
 - c. Services
 2. Business Plan - United States
 - a. Total
 - b. Products
 - c. Services
 3. Business Plan - Europe
 - a. Total
 - b. Products
 - c. Services
 4. Business Plan - General International Area
 - a. Total
 - b. Products
 - c. Services
- B. OTHER FINANCIAL ANALYSIS**

Profitability Models
Similar business

VI. ISSUES/RECOMMENDATIONS

- A. Issue
- B. Recommendation
- C. Impact

VII. MANAGEMENT TEAM

A. ORGANIZATION

- 1. Roles
- 2. Organization Chart
- 3. Staffing Plan

~~B. KEY MANAGEMENT TEAM'S PRIOR EXPERIENCE~~

THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

RECEIVED

1950

FROM

DR. J. H. HARRIS

CHICAGO

ILL.

U.S. DEPT. OF AGRICULTURE

WASHINGTON, D.C.

FOR INFORMATION OF THE BUREAU OF AGRICULTURAL CHEMISTRY

RECEIVED

BUSINESS PLANNING CONTENT GUIDE - PHASE 1**DESCRIPTION OF COMPONENTS****I. EXECUTIVE SUMMARY**

Supersedes 2 page Business Plan Summaries.

- The Executive Summary should be 2 to 3 pages.

This first section of the ABU Business Plan will be the most visible. Unless it is compelling, it may be the only section that is read in detail. The Executive Summary should be short (two to three pages) and concise. It should clearly articulate what the opportunities are, why they exist, your objectives, strategies and programs to capture the opportunity and why you are capable of succeeding, how you will gain entry and market penetration, etc. Note the key points in each section and support them with some key facts and numbers.

A. MISSION HIGHLIGHT SUMMARY

Summarize in one paragraph the key points covered in the section on Mission.

B. MARKET ANALYSIS HIGHLIGHT SUMMARY

Summarize in one paragraph the most critical information covered in the section on Market Analysis. This summary should demonstrate that your business has a market opportunity based on customer needs.

C. BUSINESS OBJECTIVES, STRATEGIES AND PROGRAMS HIGHLIGHT SUMMARY

Summarize in one paragraph the material covered in the section on Business Objectives, Strategies and Programs. You may choose to provide an overview of your Business Objectives or to highlight key messages.

D. FINANCIAL PLANS AND BUSINESS MODELS HIGHLIGHT SUMMARY

Summarize the information in the section on Financial Plans and Business Models in the context of your business, i.e. market share, growth, etc.:

- What are the key drivers of Revenue and Operating Profit?
- How do they relate to your business?
- Revenue growing, not growing, why?
- Operating Profit growing, not growing, why?

E. ISSUES/RECOMMENDATIONS HIGHLIGHT SUMMARY

Highlight in one paragraph the key issues covered in the section on Issues/Recommendations.

F. MANAGEMENT TEAM HIGHLIGHT SUMMARY

Highlight in one paragraph the key points you wish to convey about your Management Team. This may be a main theme you want to portray, the most exciting aspects, etc.

II. MISSION



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A. MISSION STATEMENT

State your "purpose for existing" in a way that people across Digital will understand. Identify:

- The purpose of the business is to enable the customer to...
- Your differentiation, your competitive advantages, why and how you are going to win.

B. BUSINESS DESCRIPTION

- What "business" are you in and how do you define your market?

In C. CUSTOMER DESCRIPTION

- Groups and definition of various Customers
- What kind of problems are your customers trying to solve?

III. MARKET ANALYSIS

A. MARKET DEFINITION

Include ABU's charter and customer description.

What segments you are focusing on today where your solutions are most applicable?

- Customer
- Demographics
- Technology
- Industry

What are your priorities?

Will they change over time?

B. MARKET SIZE/GROWTH AND SHARE *all*

1. Total Market

a. Total Market Size/Growth

- Worldwide *←*
- United States
- Europe
- General International Area

b. Total Market Share

- Worldwide
- United States
- Europe
- General International Area

2. Target Market *OEC*

a. Target Market Size/Growth

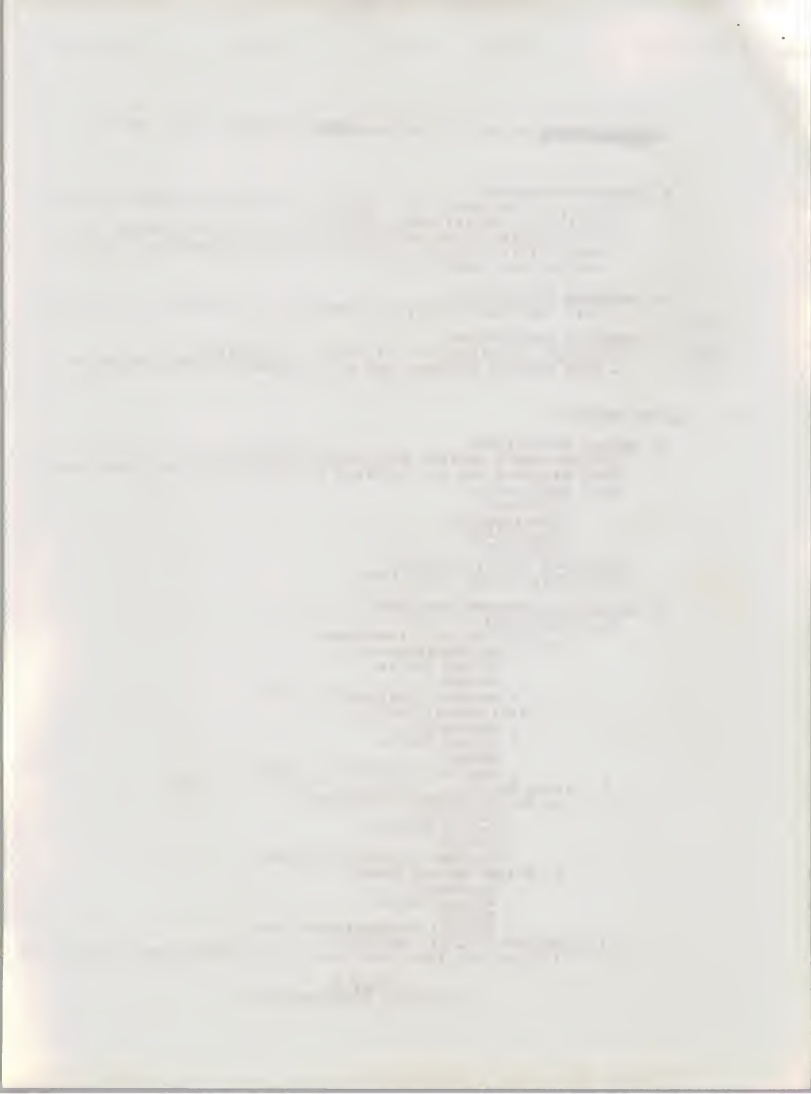
- Worldwide
- United States
- Europe
- General International Area

b. Target Market Share

- Worldwide
- United States
- Europe
- General International Area

3. Additional Market Analysis

Include any additional view of the market that is relevant



BUSINESS PLANNING CONTENT GUIDE - PHASE 1

to your business such as:

- Applications
- Industry
- Operating Systems, etc.

C. MARKET TRENDS/CUSTOMER NEEDS

Identify significant trends in the market such as:

1. Customer
 - Customer requirements/needs
 - New/evolving application areas
2. Technology
 - Technology requirements to meet customer needs
 - Applicability of new technology within targeted markets
3. Competition - Total - inc Corps, others
 - Competing/substitute products/services
 - Purchasing criteria (quality, price, performance, delivery, timing, service, warranties, etc.).
4. Economic/Political Environment
 - Economic health of customer base

INPUT's imp CPAC

D. COMPETITIVE POSITION

List your market share and your major competitor's market share in FY89 through FY94. Include emerging competitor's anticipated share.

E. MARKET ENVIRONMENT

1. Strengths

This section is internally focused and may include competitive strengths such as:

- installed base
- ✓ core competencies
- ✓ unique skills
- ✓ managerial depth/talent
- ✓ market leadership position
- proprietary technology
- cost advantages
- ✓ competitive advantages
- product innovation skills, etc.

2. Weaknesses

This section is internally focused and may include competitive weaknesses such as:

- lack of strategic direction
- loss of competitive position
- loss of profitability
- lack of key skills or competencies, etc.

3. Opportunities

This section is externally focused and may include market opportunities such as:

- new customers
- new markets
- new segments
- broader range of customer needs
- related projects
- complementary projects

1st cut
in 6 wk

ORIGINAL ARTICLES

THE EFFECT OF THE INFLUENZA VIRUS ON THE
RESISTANCE OF THE HUMAN BODY TO INFECTION
BY DR. J. H. HAY, JR., AND DR. W. C. KENDRICK
The influenza virus, which has been shown to be a
filterable agent, has been found to be present in the
nasal secretions of patients with influenza. It has
been demonstrated that the virus is capable of
multiplying in the cells of the nasal mucosa. The
virus has been shown to be stable in the dried
nasal secretions for a period of several weeks.
The virus has been shown to be capable of
surviving in the dried nasal secretions for a
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nasal secretions for a period of several weeks.

BUSINESS PLANNING CONTENT GUIDE - PHASE 1

- vertical integration
 - rapid market growth, etc.
- include all major market opportunities even if you have chosen not to invest in them at this time.

4. Threats

This section is externally focused and may include competitive threats such as:

- new competitive entrants
- substitutes
- slow market growth
- government policy
- standardization
- business cycles
- strength of buyers/suppliers
- changing customer needs
- changing market trends

F. TOP STRATEGIC ACCOUNTS

These accounts need not be prioritized by dollar volume. You may chose to prioritize them using other criteria such as high growth, new account/new market, market leadership position, etc. Provide a worldwide view. List these accounts along with ~~their~~ for FY92 and FY94. Provide a brief description of your selection criteria (i.e. Why are these accounts strategic?).

IV. BUSINESS OBJECTIVES, STRATEGIES AND PROGRAMS

A. BUSINESS OBJECTIVE *Next Yr (FY93)*

Identify the key Business Objectives of this ~~year~~ and provide an appropriately detailed description so that the objective can be understood by groups across the company.

A Business Objective is defined as:

"A Digital initiative targeted to a business opportunity by meeting a customer need better than competitors."

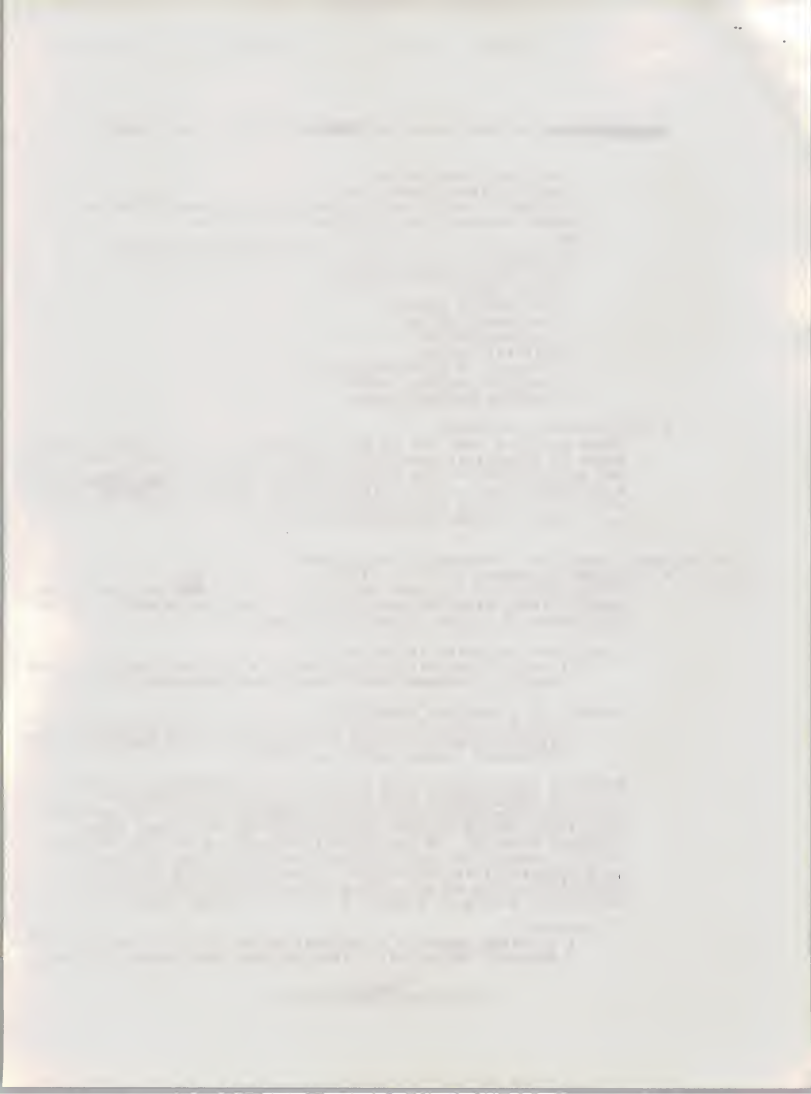
Example of a Business Objective:

"Reduce scientist's time to discovery by promoting use of visualization tools and techniques for data analysis in an integrated visualization environment."

Business Objectives should provide an encompassing view of customer requirements (not merely Digital's initiatives). From these customer requirements (i.e. opportunities), the Business Objectives should support some portion of the sought after customer benefit. If the Business Objectives are not defined broadly enough, the ABU Business Plan might lead to missed long-term opportunities for Digital. Completion of a Business Objective may be an entry into a market which will require additional action on Digital's part to maintain this advantage.

1. STRATEGY

A Strategy supports a Business Objective (i.e. How to achieve a Business Objective). Identify your Strategies in support



~~SECRET~~ BUSINESS PLANNING ~~SECRET~~ CONTENT GUIDE - PHASE 1

of the Business Objective outlined above. Provide a brief description of each Strategy. Include major technical and marketing strategies as well as major services, support and application strategies. Provide resource needs (Sales coverage) that support achievement of partner plan.

a. PROGRAM

Identify Programs (i.e. Implementation Plans) in support of the Strategy outlined above. Include a brief description of the program, identify the manager directly responsible for its success, channel requirements and major milestones with delivery dates.

2. STRATEGY

3. MEASUREMENT CRITERIA

4. RISKS/DEPENDENCIES

5. REVENUE

Δ
Dissemination

NOTE:

Include your key Business Objectives that represent a major portion of the BU's goals. Create Section IV. C. etc. as needed to communicate your key Business Objectives, Strategies and Programs.

V. FINANCIAL PLANS AND BUSINESS MODELS

A. FINANCIAL ~~SECRET~~

(This section should have a limited distribution.)

1. Business Plan - Worldwide

- a. Total
- b. Products
- c. Services

2. Business Plan - United States

- a. Total
- b. Products
- c. Services

3. Business Plan - Europe

- a. Total
- b. Products
- c. Services

4. Business Plan - General International Area

- a. Total
- b. Products
- c. Services

NOTE:

One outline of the Financial ~~SECRET~~ may change to reflect BU/BU focus.

B. OTHER FINANCIAL ANALYSIS

Include other financial analysis as it is pertinent to your

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Single Copies, Fifteen Cents.
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THE UNIVERSITY OF CHICAGO

DEPARTMENT OF CHEMISTRY

CHICAGO, ILL.

RECEIVED

APRIL 10, 1934

FROM

DR. J. H. HARRIS

CHICAGO, ILL.

TO

DR. J. H. HARRIS

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[BSU NAME]

III. MARKET ANALYSIS

B. MARKET SIZE/GROWTH AND SHARE

1. Total Market

TOTAL MARKET SIZE/GROWTH	FY89	FY90	FY91	FY92	FY93	FY94	CAGR
Worldwide	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(%)
United States	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(%)
Europe	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(%)
General International Area	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(%)

DIGITAL'S TOTAL MARKET SHARE	FY89	FY90	FY91	FY92	FY93	FY94
Worldwide	(%)	(%)	(%)	(%)	(%)	(%)
United States	(%)	(%)	(%)	(%)	(%)	(%)
Europe	(%)	(%)	(%)	(%)	(%)	(%)
General International Area	(%)	(%)	(%)	(%)	(%)	(%)



BUSINESS PLANNING ~~UNIT~~ CONTENT GUIDE - PHASE 1

FBIU NAME)

III. MARKET ANALYSIS

B. MARKET SIZE/GROWTH AND SHARE

2. Target Market

TARGET MARKET SIZE/GROWTH	FY89	FY90	FY91	FY92	FY93	FY94	CAGR
Worldwide	\$	\$	\$	\$	\$	\$	%
United States	\$	\$	\$	\$	\$	\$	%
Europe	\$	\$	\$	\$	\$	\$	%
General International Area	\$	\$	\$	\$	\$	\$	%

DIGITAL'S TARGET MARKET SHARE	FY89	FY90	FY91	FY92	FY93	FY94
Worldwide	()	()	()	()	()	()
United States	()	()	()	()	()	()
Europe	()	()	()	()	()	()
General International Area	()	()	()	()	()	()



~~SECRET~~ BUSINESS PLANNING ~~SECRET~~ CONTENT GUIDE - PHASE 1

[BU NAME]

III. MARKET ANALYSIS

B. MARKET SIZE/GROWTH AND SHARE

3. Additional Market Analysis

[]



~~XXXXXXXXXX~~ BUSINESS PLANNING ~~XXXXXXXXXX~~ CONTENT GUIDE - PHASE 1

[ABU NAME]

III. MARKET ANALYSIS

C. MARKET TRENDS/CUSTOMER NEEDS

11



~~CONFIDENTIAL~~ BUSINESS PLANNING ~~CONFIDENTIAL~~ CONTENT GUIDE - PHASE 1

[BU NAME]

III. MARKET ANALYSIS

D. COMPETITIVE POSITION

COMPETITIVE MARKET SHARE	FY89	FY90	FY91	FY92	FY93	FY94
Digital	[]	[]	[]	[]	[]	[]
[Competitor]	[]	[]	[]	[]	[]	[]
[Competitor]	[]	[]	[]	[]	[]	[]
[Competitor]	[]	[]	[]	[]	[]	[]
Other	[]	[]	[]	[]	[]	[]
Total	100%	100%	100%	100%	100%	100%



~~SECRET~~ BUSINESS PLANNING ~~SECRET~~ CONTENT GUIDE - PHASE 1

[BU NAME]

III. MARKET ANALYSIS

E. MARKET ENVIRONMENT

1. STRENGTHS
[]
2. WEAKNESSES
[]
3. OPPORTUNITIES
[]
4. THREATS
[]



~~CONFIDENTIAL~~ BUSINESS PLANNING ~~CONFIDENTIAL~~ CONTENT GUIDE - PHASE 1

[ABU NAME]

III. MARKET ANALYSIS

F. TOP STRATEGIC ~~CONFIDENTIAL~~ Opportunities

STRATEGIC ACCOUNT	FY92	FY94
[]	[]	[]
[]	[]	[]
[]	[]	[]
Subtotal	_____	_____
Other Accounts	[]	[]
Total Revenue \$M	----	----

SELECTION CRITERIA:

[]

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INPUT

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CONTACT REPORT

INPUT

Staff: Init. PAC Init. _____ ☐ INPUT office ☐ Client Office ☒ Other _____Contact Date: 2/4/92Date Written: 2/9/92

Company	<u>Digital</u>	DISTRIBUTION:			Prog./Proj. ID _____
		Action	Info.	By When	Describe Action-F/U
Name	<u>CHERYL NORTH</u>		<u>Tom</u>	<u>(already given by phone.)</u>	
Title					
Address					
Phone:	<u>(603) 726-9824</u>				
Fax:	<u>()</u>				

- Real concern on proposal. Feeling it is too expensive
- Asked if we could do it without internal interviewing - I said yes if we could leave out internal constraints or approach in general way Cheryl and I had discussed.
- On 27th Feb. went home with Peter
- Important to have CIA included: Australia, Singapore, Korea and Japan. I said this would more than make up reduction in cost of not doing internal work (20%).
- Asked us to look a bid in light of on-going work
- Strong enough feeling they should do competitive bid-Cheryl is against it.

☐ Continued over



**A PROPOSAL
TO ASSESS THE BUSINESS OPPORTUNITY
FOR OFFERING WAN SERVICES TO THE
GLOBAL MARKETPLACE**

Submitted to:

Corporate Telecommunications

Digital Equipment Corp.

Littleton, MA

Feb 20
~~January 29, 1992~~

INPUT

1280 Villa Street
Mountain View, CA 94041
415-961-3300
Fax: 415-961-3966

The Atrium at Glenpointe
400 Frank W. Burr Boulevard
Teaneck, NJ 07666
201-801-0050
Fax: 201-801-0441

I. OBJECTIVES

Corporate Telecommunications (CT) within Digital is assessing the business opportunity for offering WAN services to the global marketplace.

end to end connectivity

value added

INPUT has been invited to submit a proposal which would help Digital analyze this opportunity. The ~~first phase of~~ research, to be completed by the end of March, would focus on the size and nature of the opportunity, using the SI Cluster in Digital Services as the distribution channel. Subsequent phases would identify the opportunities for using additional distribution channels.

?

II. SCOPE

Best or based on mkt potential
Whole own sub / separate business

The overall scope of this study (Phase 1) is contained in the tasks described in the "Business Planning Content Guide" which was reviewed with INPUT in a meeting with CT staff on January 24.

INPUT's approach to this project will address two principal issues:

① on transmission netw & ② on the data netw

- ① The size and nature of the business opportunity available to Digital in general for ~~connectivity~~ & *Value added*

use own or segregated netw

- ~~The size and nature of the business opportunity available to CT working through the SI Cluster~~

- ③ *What are the risks*

reg, legal, security

barrier to entry & competition

Some of the other key issues which the study will focus on include:

- What is the relation between providing CT WAN services and the outsourcing market generally?

end to end connectivity

① - What is the relationship between providing ~~CT WAN~~ services and providing systems integration services (using the concept "systems integration" in the broadest sense)?

② - Does Digital as a corporation have special advantages or disadvantages in supplying these services?

③ - What are the factors which will affect the size and growth of this market? How similar will conditions be in the U.S. and Europe? *→ G-7 A (Pac Rim)*

- To what extent does Digital's organizational arrangement facilitate or interfere with Digital's potential for penetrating this market?

not profit structure?

Want to und cost structure



cross-section of part'l customers
across a
INPUT will focus on the opportunity within current Digital customers. Other customer sets can be researched in later phases.

INPUT expects that issues will be refined in the course of the project, as a result of initial discussions with CT staff as well as feedback from customer interviews.

Note: Due to the compressed time frame for this study, this phase of research will focus on the U.S. and Europe. INPUT's working assumption is that if the concept proves itself in these key markets, then the rest of the world market size can be estimated for Phase 1 and analyzed in more detail, if required, in Phase 2.

A later phase, or phases, would also address such issues as:

- The effect on the opportunity if the IBUs/ABUs were involved directly
- CT offering these services directly
- The effect of CT working with and through external third parties

III. METHODOLOGY

INPUT will utilize the following sources of information for this project:

- Prior research that INPUT has conducted in this area including the following publicly available studies:
 - World Wide Information Services Market
 - Network Integration
 - Network Operations Management
 - U.S. Network Services Market
 - European Network Services Market
- Interviews with potential customers for this service, among current Digital customers in the U.S. and Europe & G-11
- Interviews with Digital staff

(limited)

*Japan
Australia
HK/Sing*



INPUT will suggest to Digital the most viable when offering for DOE to take to market

- The insight and overall market knowledge gained from prior custom research and consulting, including:
 - A year-long engagement with one of the world's largest enterprises assisting them in evaluating the market opportunities for offering their internal information systems capabilities to the commercial market. Included was an analysis of the opportunities in offering services on their very large private network.
 - A study for a significant organizational unit within a very large telecommunications company which examined how their services could be offered on a more commercial basis. This included developing a business plan for an expanded series of services.
 - Several studies for large financial services firms in which internally-developed products and services were evaluated for their appropriateness for being offered to a wider commercial market. These studies involved considerable external market research.

The following describes the activities of INPUT in this project. In specific instances noted, INPUT will require information or other assistance from CT.

There will be initial discussions with CT staff to refine the scope, to identify other ~~Digital staff to be interviewed~~, as well as to begin preliminary work on interview guides and questionnaires.

After approval, INPUT will meet with CT staff to review in more detail current and planned offerings and research materials already obtained. INPUT will also begin interviews with other Digital staff (e.g., IBU, ABU and SI staff -- possibly in Europe as well as the U.S.). These internal interviews will be necessary in order to assess the size and nature of the opportunity available to CT working through the SI Cluster. This opportunity is assumed to be different and smaller than the opportunity available to Digital overall.

As soon as the questionnaire contents are finalized, INPUT will begin interviewing Digital customers. In addition to the normal segmentation of potential customers for this service (geography, size, industry), CT should also distinguish between prospects whose receptivity toward the concept is known or unknown (and among "knowns" between those enterprises who are positive and those who are negative).

INPUT recommends that 15-20 Digital customers be interviewed in the U.S. and 10-15 in Europe. INPUT anticipates that multiple interviews will be held in many organizations (e.g., CIO, Telecomm Director, CFO and functional managers). For this study INPUT does not recommend a large survey panel oriented toward producing extensive quantitative analyses. Instead, INPUT intends to obtain in-depth information to help put boundaries around this developing market.



review
IN CONCENT WITH INPUT
Digital will supply company and contact names. At the kickoff meeting INPUT and Digital will review the advantages and disadvantages of Digital's name being associated with the interview research. *

SIX (two per geography)
INPUT also recommends that 35 interviews be conducted with potential distributors of these services to generally assess this channel. A more detailed investigation can be made in phase 2 if warranted. (from a customer/distributor/competitor standpoint)
(a later)

INPUT will keep Digital informed of the project status on a regular basis. Approximately one-quarter of the way through the customer interviews, INPUT will hold a progress review meeting with Digital. If there are preliminary findings which suggest a change in research direction, these findings will be brought up and discussed in depth.

INPUT will analyze the interviews and integrate information available from other sources. INPUT will prepare its findings in two forms: overhead transparencies and a written report. Feedback from the presentation will be incorporated into the written report.
(initial) (the week of March 16)

INPUT will present the findings at DTMC

IV. DELIVERABLES

(Mar 30-Apr 9)

In the course of this study, Digital will receive the following materials which will provide Digital with an understanding of the opportunities in this market:

- The findings of the study in overhead transparency format
- A written report following the format provided in the "Business Planning Content Guide" (as further modified in the meeting of January 24)
- Copies of customer interview data, if desired (with identities removed as necessary)

Two Presentations (one to DTMC + one to be determined)



Unchanged

VI. FEE

The professional fee for this project (Phase 1) is \$57,000. In addition, out-of-pocket expenses (including travel, telephone, and production expenses) will be billed at cost. Out-of-pocket expenses are estimated to be no more than 10% of the professional fee. One-half of this fee (\$28,500) is due and payable on the authorization of this project. The remainder of the professional fee and out-of-pocket expenses will be invoiced upon submission of the written report.

This proposal is valid for thirty days unless extended in writing.

VII. AUTHORIZATION

To authorize the project as specified, please sign and return one copy of this proposal, along with the initial fee. Upon acceptance by INPUT, a countersigned copy of the proposal will be returned to Digital.

AUTHORIZED BY:
Digital Equipment

ACCEPTED BY:
INPUT

Name

Name

Title

Title

Date

Date



1 shore
handwritten comment

resell bandwidth

I. OBJECTIVES

Corporate Telecommunications (CT) within Digital is assessing the business opportunity for offering WAN "connectivity" (transmission) and value-added services to the global marketplace.

INPUT has been invited to submit a proposal which would help Digital evaluate this opportunity. The research, to be completed by the end of March, would focus on the size and nature of the opportunity.

II. SCOPE

The overall scope of this study is contained in the tasks described in the "Business Planning Content Guide" which was reviewed with INPUT in a meeting on 1/24/95 staff on January 24th.

The study's approach to this project will address the following:

- *** The size and nature of the business opportunity available to Digital in general for "connectivity" (A) Digital's transmission network, for (B) Digital's data network and (C) for value-added services (size by geography - US, Europe, GIA)

- *** What are the risks in providing "connectivity" (A) regulatory, legal, security, barriers to entry, competitive impact from carriers on Digital investment return, etc.)

Some of the other key issues which the study will focus on include

- What is the relationship between providing WAN services and providing systems integration services (using the concept "systems integration" in the broadest sense)?
- Does Digital as a corporation have special advantages or disadvantages in supplying these services?

What are the factors which will affect the size and growth of this market? How similar will conditions be in the U.S., Europe and GIA?

- *** Will Digital be more successful by creating a wholly-owned subsidiary (i.e., separate company) in providing WAN services to the marketplace

INPUT will focus on the opportunity across a cross-section of potential customers. Additional customer sets can be researched in later phases.

* GIA specifically refers to Hong Kong/Singapore, Japan, Australia, and potentially others for purposes of INPUT's evaluation.

vs ongoing transmission
interview

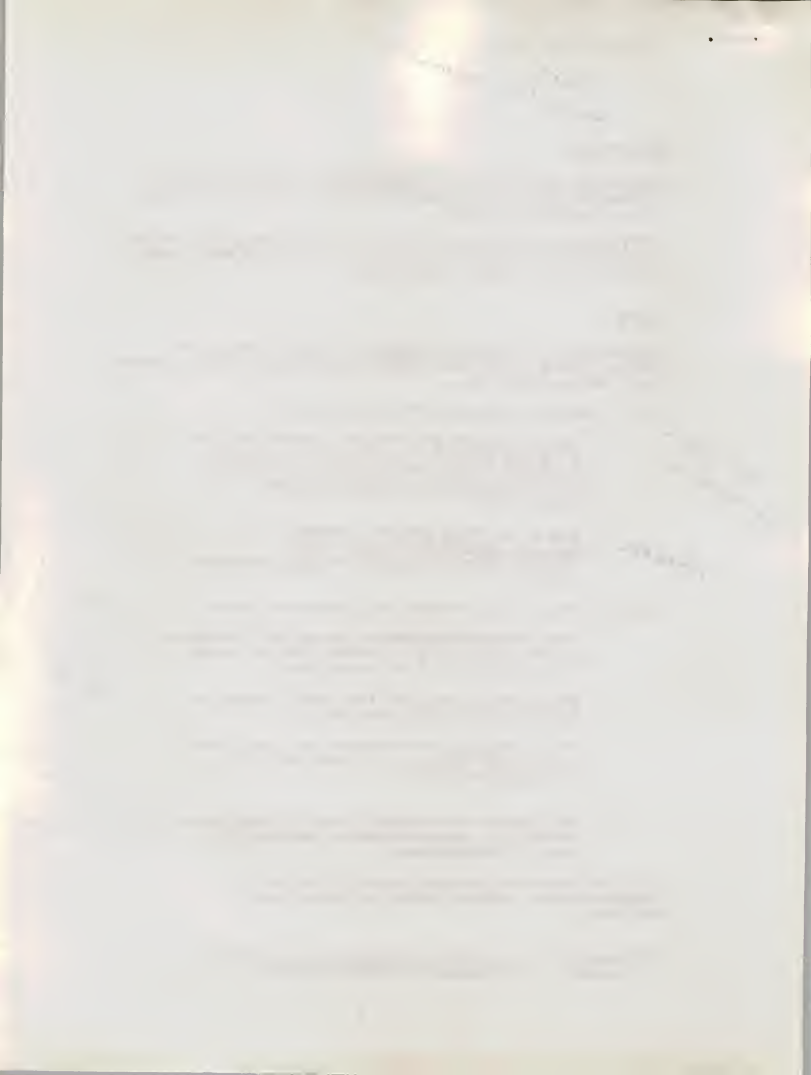
rely on DEC

X

Val, Loh
& use for int

Outsourcing
Keep in &
define

ed process
what has
competition done?



INPUT expects that issues will be refined in the course of the project, as a result of initial discussions with CT staff as well as feedback from customer interviews.

10. METHODOLOGY

INPUT will utilize the following sources of information for this project:

Prior research that INPUT has conducted in this area including the following publicly available studies:

- Worldwide Information Services Market
- Network Integration
- Network Operations Management
- U.S. Network Services Market
- European Network Services Market
- Pacific Rim Network Services Market

Interviews with potential customers for this service in the U.S., Europe, and GIA.

Interviews (limited) with Digital staff.

The insight and overall market knowledge gained from prior custom research and consulting including:

- A research engagement with one of the world's largest economies assisting them in evaluating the market opportunities for offering their internal information systems capabilities to the commercial market. Included was an analysis of the opportunities in offering services on their very large private network.
- A study for a significant organizational unit within a very large telecommunications company which examined how their services could be offered on a more commercial basis. This included developing a business plan for an expanded series of services.

Several studies for large financial services firms in which internally-developed products and services were evaluated for their appropriateness for being offered to a wider commercial market. These studies involved considerable external market research.

THE JOURNAL OF THE
ROYAL ANTHROPOLOGICAL INSTITUTE

Vol. 100, Part 1

1970

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ROYAL ANTHROPOLOGICAL INSTITUTE

Vol. 100, Part 1

1970

The following describes the activities of INPUT in this project. In specific instances noted, INPUT will require information or other assistance from CT.

There will be initial discussions with CT staff to refine the scope as well as to begin preliminary work on interview guides and questionnaires.

After approval, INPUT will meet with CT staff to review in more detail current and planned offerings and research materials already obtained. INPUT will assist to Digital the most viable WAN offerings for Digital to present to the market.

As soon as the questionnaire contents are finalized, INPUT will begin interviewing Digital customers.

INPUT recommends that twelve (12) Digital customers be interviewed in the U.S., twelve (12) in Europe and twelve (12) in Asia. INPUT anticipates that multiple interviews will be held in many organizations (e.g., CIO, Telecomm. Director, CFO and general managers). For this study INPUT does not recommend a large survey panel oriented toward producing exclusive quantitative analyses. Instead INPUT intends to gather in-depth information to help set boundaries around this developing market.

Digital will supply company names. At the kick-off meeting INPUT and Digital will review the advantages and disadvantages of Digital's membership associated with the interview research.

INPUT also recommends that six (6) interviews (2 per geography -- 2 U.S., 2 Europe, and 2 Asia) be conducted with potential competitors or those services to generally assess this market. A more detailed investigation may be made in place as warranted.

INPUT will keep Digital informed of the project status on a regular basis. Approximately one-quarter of the way through the customer interviews, INPUT will hold a progress review meeting with Digital. If there are preliminary findings which suggest a change in research direction, these findings will be brought up and discussed in depth.

INPUT will analyze the interviews and integrate information available from other sources. INPUT will prepare its findings in two forms: overhead transparencies and a written report. Feedback from the initial presentation (week of 3/16/92) will be incorporated into the written report. INPUT will present findings at DTMC during last week of March/first week of April (3/30 - 4/3/92).

INPUT to
Sign
general list
//

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. The text also mentions the need for regular audits to ensure that all financial data is correctly recorded and reported.

In the second part, the document outlines the procedures for handling financial data. It details the steps involved in collecting, processing, and analyzing financial information. The text also discusses the importance of data security and the measures taken to protect sensitive financial data from unauthorized access.

The third part of the document focuses on the reporting of financial results. It describes the format and content of financial reports, including the balance sheet, income statement, and cash flow statement. The text also discusses the importance of providing clear and concise information to stakeholders and the role of management in ensuring the accuracy of the reports.

The final part of the document provides a summary of the key points discussed. It reiterates the importance of accurate record-keeping, proper data handling procedures, and clear financial reporting. The text also mentions the role of the finance department in ensuring the overall financial health of the organization.

DELIVERABLES

In the course of this study, Digital will receive the following materials which will provide Digital with an understanding of the opportunities in the market:

- The findings of the study in overhead transparency format

- A written report following the format provided in the "Business Planning Commitment Letter" (as further modified in the meeting of January 24)

- Copies of customer interview data, if desired (with identities removed in summary)

- Presentation to DTHC and one (1) other participant (as part of the standard VPPVT proposal submitted to Engage)

V. SCHEDULE

The following schedule describes the activities by week. Both INPUT and Digital will have to make every effort to complete their activities in the time specified. ~~This is a tight schedule~~ ~~Contract to~~ must be signed ~~at~~ by March 2nd to maintain this schedule.

Week of beginning	Activity
1/27 2/17	Digital provides verbal approval in principle for project
2/3 2/24	Preliminary work on project begins <ul style="list-style-type: none"> - Digital prepares lists of corporations - INPUT drafts interview guides - INPUT prepares generic list of connectivity services - INPUT and Digital define project specifics further
2/10 3/2	Final approval Contract signed INPUT meets with CT <ul style="list-style-type: none"> - Initial assessment of CT services to be offered - Review interview guides
2/17 3/9	Digital staff interviews completed INPUT meets with CT <ul style="list-style-type: none"> - CT Services assessment completed - Interview guide finalized
	Customer interviewing begins (U.S., Europe & GIA)
	CT Staff
3/2 3/23	INPUT and Digital hold a progress review (3/30) (3/30)
3/2 4/6	INPUT presents overview findings to DTMC (4/3) Customer interviews completed
	INPUT conducts additional research, as required
	INPUT completed analysis of interviews
3/9 4/13	INPUT prepares a presentation version of findings and begins draft report
	Preliminary review of findings with CT staff
3/16 4/27	INPUT presents findings in overhead transparency format to DTMC (via video)
3/23 5/4*	INPUT delivers final report
3/31	INPUT presents findings to DTMC and to subsequent review meeting in April - June 15, 1992

* Or one week after initial presentation, if presentation is delayed



INPUT

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CONTACT REPORT

INPUT

Staff: Init.

TAR

Init.

☐ INPUT office

☐ Client Office

☐ Other

Out

Tel

Contact Date: 2/7/92

Date Written: 2/10/92

Company	DCE			DISTRIBUTION:	Prog./Proj. ID
Name	David Cedrone	Action	Info.	By When	Describe Action-F/U
Title		TAR		2/11?	Revise proposal
Address		C+PAC if material sent to him			after getting DCE feedback
Phone: (508) 952-3916					
Fax: ()					

As noted on earlier contact rpt. David is supposed to be coordinating the proposal. He is aware of PAC conversation w/ Cheryl North.

Cheryl has taken the proposal & is suggesting revision, making comments. David doesn't know if the revised proposal will be sent to him (for forwarding to me) or directly from Cheryl to PAC for me. (David was a little embarrassed over the lack of coordination on DCE's part)

8 are apparently no longer a critical issue

As Cheryl had told PAC, the desire on their part is to "test" the internal interview to doing research on "test of world"

I cautioned David that if DCE was looking for a market assessment on the "SI Cluster" opportunity from an external source, then there would have to be some basis for this assessment i.e., interviews. He seemed to understand that.

I explained that I would be traveling Feb 12-14 so it would be desirable to send us the

revision by Feb 11. He agreed

☐ Continued over



TM

d	i	g	i	t	a	l
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MKO2 FAX COVER SHEET

TO:

Tom O'Flaherty

LOCATION:

Copy 77

TELEPHONE NO.:

(212) 955-9340

FAX PHONE NO.:

(212) 874-5196

DATE:

2/17/92

NUMBER OF PAGES TO FOLLOW:

6

FROM:

CHERYL NORTH

MAILSTOP/LOC:

MKO2-1/F10

COST CENTER:

C3V

TELEPHONE NO.:

DTN 264-1054

COMMENTS:

Update from 2/17/92 phone discussion
with Cedrone, Schweiger, King, & (Deputy) T. O'Flaherty
For use in phone call with Tom on 2/18/92 @ 5:00 p.m.
(U.S.A. - EST).



I. OBJECTIVES

Corporate Telecommunications (CT) within Digital is assessing the business opportunity for offering WAN "connectivity" (transmission) and value-added services to the global marketplace.

INPUT has been invited to submit a proposal which would help Digital evaluate this opportunity. The research, to be completed by the end of March, would focus on the size and nature of the opportunity.

II. SCOPE

The overall scope of this study is contained in the tasks described in the "Business Planning Content Guide" which was reviewed with INPUT in a meeting with CT staff on January 24th.

INPUT's approach to this project will address the following:

*** The size and nature of the business opportunity available to Digital in general for "connectivity" for (A) Digital's transmission network, for (B) Digital's data network and (C) for value-added services (size by geography -- US, Europe, GIA).

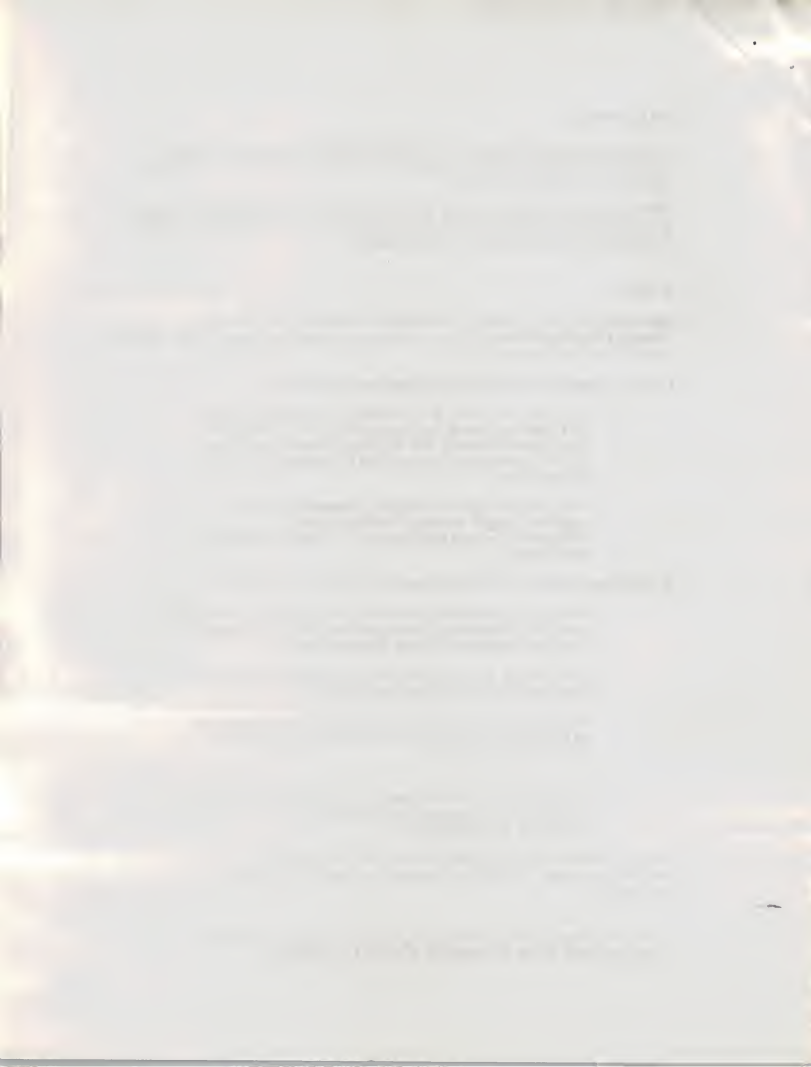
*** What are the risks in providing "connectivity" (i.e., regulatory, legal, security, barriers to entry, competitive, impact from carriers on Digital, investment; return, etc.)

Some of the other key issues which the study will focus on include:

- What is the relationship between providing WAN services and providing systems integration services (using the concept "systems integration" in the broadest sense)?
 - Does Digital as a corporation have special advantages or disadvantages in supplying these services?
 - What are the factors which will affect the size and growth of this market? How similar will conditions be in the U.S., Europe and GIA?
- *** Will Digital be more succesful by creating a wholly-owned subsidiary (i.e., separate company) in providing WAN services to the marketplace.

INPUT will focus on the opportunity across a cross-section of potential customers. Additional customer sets can be researched in later phases.

* GIA specifically refers to Hong Kong/Singapore, Japan, Australia, and potentially Korea for purposes of INPUT's evaluation.



INPUT expects that issues will be refined in the course of the project, as a result of initial discussions with CT staff as well as feedback from customer interviews.

III. METHODOLOGY

INPUT will utilize the following sources of information for this project:

- Prior research that INPUT has conducted in this area including the following publicly available studies:
 - Worldwide Information Services Market
 - Network Integration
 - Network Operations Management
 - U.S. Network Services Market
 - European Network Services Market
 - Pacific Rim Network Services Market
- Interviews with potential customers for this service in the U.S., Europe, and CIA.
- Interviews (limited) with Digital staff
- The insight and overall market knowledge gained from prior custom research and consulting including:
 - A year-long engagement with one of the world's largest enterprises assisting them in evaluating the market opportunities for offering their internal information systems capabilities to the commercial market. Included was an analysis of the opportunities in offering services on their very large private network.
 - A study for a significant organizational unit within a very large telecommunications company which examined how their services could be offered on a more commercial basis. This included developing a business plan for an expanded series of services.
 - Several studies for large financial services firms in which internally-developed products and services were evaluated for their appropriateness for being offered to a wider commercial market. These studies involved considerable external market research.

THE UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

WASH. D. C. 20250

TO: THE SECRETARY OF THE INTERIOR, WASHINGTON, D. C.

FROM: THE DIRECTOR, BUREAU OF LAND MANAGEMENT,
WASHINGTON, D. C.

SUBJECT: [Illegible]

[Illegible]

[Illegible]

[Illegible]

[Illegible]

[Illegible]

RE: [Illegible]

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The following describes the activities of INPUT in this project. In specific instances noted, INPUT will require information or other assistance from CT.

There will be initial discussions with CT staff to refine the scope as well as to begin preliminary work on interview guides and questionnaires.

After approval, INPUT will meet with CT staff to review in more detail current and planned offerings and research materials already obtained. INPUT will suggest to Digital the most viable WAN offerings for Digital to present to the marketplace.

As soon as the questionnaire contents are finalized, INPUT will begin interviewing Digital customers.

INPUT recommends that twelve (12) Digital customers be interviewed in the U.S., twelve (12) in Europe and twelve (12) in GIA. INPUT anticipates that multiple interviews will be held in many organizations (e.g., CIO, Telecomm Director, CFO and general managers). For this study INPUT does not recommend a large survey panel oriented toward producing extensive quantitative analyses. Instead INPUT intends to obtain in-depth information to help put boundaries around this developing market.

Digital will supply company names. At the kickoff meeting INPUT and Digital will review the advantages and disadvantages of Digital's name being associated with the interview research.

INPUT also recommends that six (6) interviews (2 per geography -- 2 U.S., 2 Europe, and 2 GIA) be conducted with potential distributors of these services to generally assess this channel. A more detailed investigation can be made in phase 2, if warranted.

INPUT will keep Digital informed of the project status on a regular basis. Approximately one-quarter of the way through the customer interviews, INPUT will hold a progress review meeting with Digital. If there are preliminary findings which suggest a change in research direction, these findings will be brought up and discussed in depth.

INPUT will analyze the interviews and integrate information available from other sources. INPUT will prepare its findings in two forms: overhead transparencies and a written report. Feedback from the initial presentation (week of 3/16/92) will be incorporated into the written report. INPUT will present findings at DTMC during last week of March/first week of April (3/30 - 4/3/92).

IV. DELIVERABLES

In the course of this study, Digital will receive the following materials which will provide Digital with an understanding of the opportunities in this market:

- The findings of the study in overhead transparency format
- A written report following the format provided in the "Business Planning Content Guide" (as further modified in the meeting of January 24)
- Copies of customer interview data, if desired (with identities removed as necessary)
- Presentation to DTMC and one (1) other presentation (as part of the standard INPUT proposal submitted to Digital).

v

ASTOR LENOX AND TILDEN FOUNDATIONS
 455 N. 5TH ST. NEW YORK, N. Y. 10017

THE NEW YORK PUBLIC LIBRARY

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 ASTOR LENOX AND TILDEN FOUNDATIONS

455 N. 5TH ST. NEW YORK, N. Y. 10017

V. SCHEDULE

The following schedule describes the activities by week. Both INPUT and Digital will have to make every effort to complete their activities in the time specified.

<u>Week of</u>	<u>Activity</u>
4/27 2/17	Digital provides verbal approval in principal for project
2/3 2/24	Preliminary work on project begins <ul style="list-style-type: none"> - Digital prepares lists of corporations - INPUT drafts interview guides - INPUT and Digital define project specifics further
2/10 3/2	Final approval INPUT meets with CT <i>int guide 97</i>
	Customer interviewing begins (U.S., Europe & GIA)
2/17	Digital staff interviews completed
3/16	INPUT and Digital hold a progress review
3/2 3/30	Customer interviews completed INPUT conducts additional research, as required INPUT completed analysis of interviews
3/9 4/6	INPUT prepares a presentation version of findings and begins draft report
4/13	Preliminary review of findings with CT staff
3/16 4/20	INPUT presents findings in overhead transparency format
3/23 4/27	INPUT delivers final report
3/31	INPUT presents findings to DTMC and to subsequent review meeting in April - June 15, 1992

1. The first part of the report is devoted to a general survey of the situation in the country.	100
2. The second part is devoted to a detailed analysis of the economic situation.	150
3. The third part is devoted to a detailed analysis of the social situation.	200
4. The fourth part is devoted to a detailed analysis of the political situation.	250
5. The fifth part is devoted to a detailed analysis of the cultural situation.	300
6. The sixth part is devoted to a detailed analysis of the environmental situation.	350
7. The seventh part is devoted to a detailed analysis of the international situation.	400
8. The eighth part is devoted to a detailed analysis of the future prospects.	450
9. The ninth part is devoted to a detailed analysis of the conclusions.	500
10. The tenth part is devoted to a detailed analysis of the recommendations.	550
11. The eleventh part is devoted to a detailed analysis of the annexes.	600
12. The twelfth part is devoted to a detailed analysis of the bibliography.	650
13. The thirteenth part is devoted to a detailed analysis of the index.	700
14. The fourteenth part is devoted to a detailed analysis of the appendices.	750
15. The fifteenth part is devoted to a detailed analysis of the summary.	800
16. The sixteenth part is devoted to a detailed analysis of the introduction.	850
17. The seventeenth part is devoted to a detailed analysis of the conclusion.	900
18. The eighteenth part is devoted to a detailed analysis of the recommendations.	950
19. The nineteenth part is devoted to a detailed analysis of the annexes.	1000
20. The twentieth part is devoted to a detailed analysis of the bibliography.	1050
21. The twenty-first part is devoted to a detailed analysis of the index.	1100
22. The twenty-second part is devoted to a detailed analysis of the appendices.	1150
23. The twenty-third part is devoted to a detailed analysis of the summary.	1200
24. The twenty-fourth part is devoted to a detailed analysis of the introduction.	1250
25. The twenty-fifth part is devoted to a detailed analysis of the conclusion.	1300
26. The twenty-sixth part is devoted to a detailed analysis of the recommendations.	1350
27. The twenty-seventh part is devoted to a detailed analysis of the annexes.	1400
28. The twenty-eighth part is devoted to a detailed analysis of the bibliography.	1450
29. The twenty-ninth part is devoted to a detailed analysis of the index.	1500
30. The thirtieth part is devoted to a detailed analysis of the appendices.	1550
31. The thirty-first part is devoted to a detailed analysis of the summary.	1600
32. The thirty-second part is devoted to a detailed analysis of the introduction.	1650
33. The thirty-third part is devoted to a detailed analysis of the conclusion.	1700
34. The thirty-fourth part is devoted to a detailed analysis of the recommendations.	1750
35. The thirty-fifth part is devoted to a detailed analysis of the annexes.	1800
36. The thirty-sixth part is devoted to a detailed analysis of the bibliography.	1850
37. The thirty-seventh part is devoted to a detailed analysis of the index.	1900
38. The thirty-eighth part is devoted to a detailed analysis of the appendices.	1950
39. The thirty-ninth part is devoted to a detailed analysis of the summary.	2000
40. The fortieth part is devoted to a detailed analysis of the introduction.	2050
41. The forty-first part is devoted to a detailed analysis of the conclusion.	2100
42. The forty-second part is devoted to a detailed analysis of the recommendations.	2150
43. The forty-third part is devoted to a detailed analysis of the annexes.	2200
44. The forty-fourth part is devoted to a detailed analysis of the bibliography.	2250
45. The forty-fifth part is devoted to a detailed analysis of the index.	2300
46. The forty-sixth part is devoted to a detailed analysis of the appendices.	2350
47. The forty-seventh part is devoted to a detailed analysis of the summary.	2400
48. The forty-eighth part is devoted to a detailed analysis of the introduction.	2450
49. The forty-ninth part is devoted to a detailed analysis of the conclusion.	2500
50. The fiftieth part is devoted to a detailed analysis of the recommendations.	2550

VI. FEE

The professional fee for this project (Phase 1) is \$57,000. In addition, out-of-pocket expenses (including travel, telephone, and production expenses) will be billed at cost. Out-of-pocket expenses are estimated to be no more than 10% of the professional fee. One-half of this fee (\$28,500) is due and payable on the authorization of this project. The remainder of the professional fee and out-of-pocket expenses will be invoiced upon submission of the written report.

This proposal is valid for thirty days unless extended in writing.

VII. AUTHORIZATION

To authorize the project as specified, please sign and return one copy of this proposal, along with the initial fee. Upon acceptance by INPUT, a countersigned copy of the proposal will be returned to Digital.

AUTHORIZED BY:
Digital Equipment Corporation

ACCEPTED BY:
INPUT

Name

Name

Title

Title

Date

Date



CONFIDENTIAL - Property of DDCY

CONTACT REPORT

REPORT OF CONTACT WITH A SOURCE

Date: 1/14/14

Time: 1:24 PM

FIC-101

000000

Source Name
Address
City/State/Zip
Phone
Other Contact Information

Source Name & Address
City/State/Zip
Phone
Other Contact Information
Source ID

Reporting Officer

Date: 1/14/14

Time: 1:24 PM

Topic: info

Status: info

Priority: info

Action: info

Result: info

Comments: info

Signature: info

Date: 1/14/14

Time: 1:24 PM

Topic: info

Status: info

Priority: info

Action: info

Result: info

Comments: info

Signature: info

Date: 1/14/14

Time: 1:24 PM

Topic: info

Status: info

Priority: info

Action: info

Result: info

Comments: info

Signature: info

Date: 1/14/14

Time: 1:24 PM

Topic: info

Status: info

Priority: info

Action: info

Result: info

Comments: info

Signature: info

Date: 1/14/14

Time: 1:24 PM

Topic: info

Status: info

Priority: info

Action: info

Result: info

Comments: info

Signature: info

Date: 1/14/14

Time: 1:24 PM

Topic: info

Status: info

Source Name
Address
City/State/Zip
Phone
Other Contact Information

Source Name & Address
City/State/Zip
Phone
Other Contact Information
Source ID

Source Name
Address
City/State/Zip
Phone
Other Contact Information

Source Name & Address
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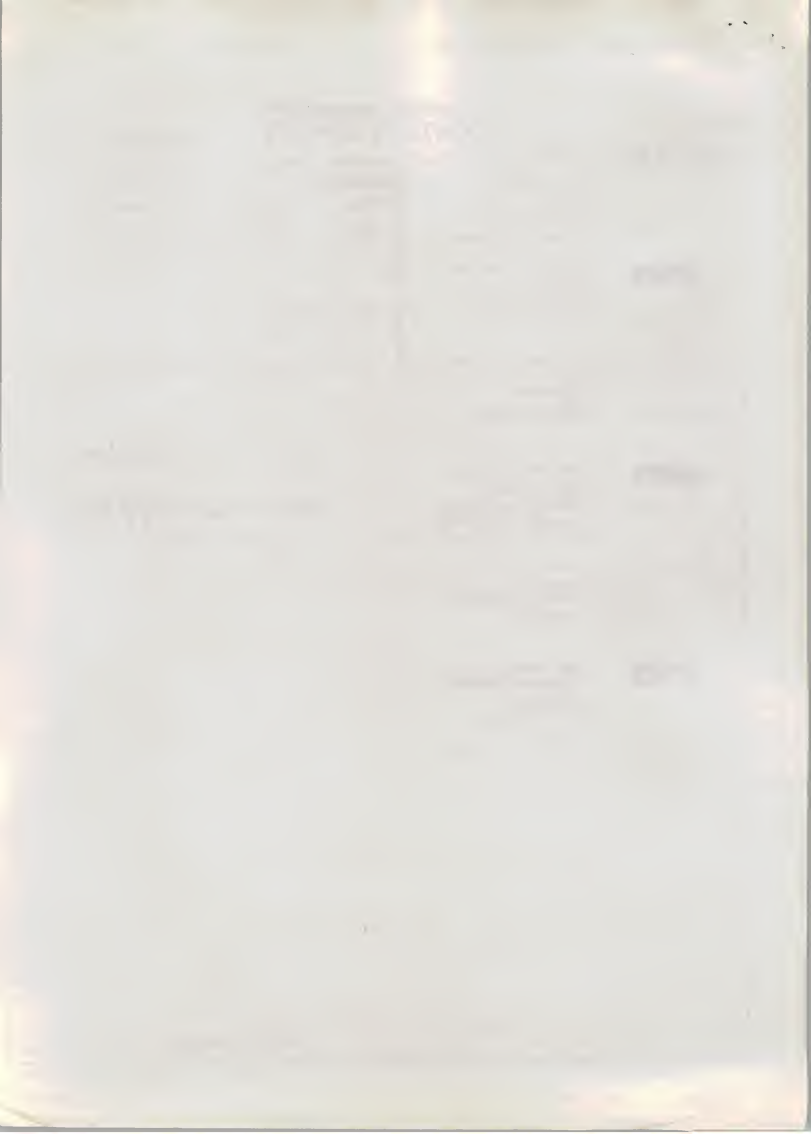
Source Name
Address
City/State/Zip
Phone
Other Contact Information

Source Name
Address
City/State/Zip
Phone
Other Contact Information

ATTACHED

NYT/HRH

NYT/HRH



1/17/72

Said we could have the checks there

- Opportunities for service to members and staff, etc.
- we should talk to some of them

1000 people in 100 groups. Also have another 1000 people in 3 geographical regions. To better the way in which they are done.

The question whether you will have and the Singapore to come.

The project would be presented at next meeting. Which includes people from Digital Service and 3 geographical areas will be in it.

Steve Harvey came tomorrow in. Steve working for Segre Co. Took 14 years to get awarded NIS group.

Problem of organization in U.S.

Look at opportunity for transition at Thiele (2nd document) - based on NIS applications.

? What will not return. Consistency

Applications turned in by NIS and ISRS.



Budget for 71 - £150m

1982 - 200m

20m, investment

Plus investment benefits from investment
in other areas of NHS

Cost of developing infrastructure & services

General committee structure

- 1/3 Government Management Committee of NHS
to be known

United Kingdom telephone industry is not a monopoly

International network with 1000 lines 2000

- Different from public sector network

+ Attempts to be in (interview) a list of Digital Suppliers

Used OSS model of 7 layers

- Selling connectivity as Layer 1 and 2

- Value added services 3-5(?)

Have good relationship with ICB

Value added network

= Ringnet 20,000 nodes

IPNet 20,000 nodes



- H&N is a 100% - 200% 'intergovernmental' organization
participate with the private sector - would come
mainly from

Future - just 100% private
- no public sector

Largest private enterprise in the world

Other private sector people - most supporting initiatives
- 100% private
- 100% private

Initiative character

1. 100% private
2. 100% private
3. 100% private
4. Direct

Two opportunities for 100%

1. Help to differentiate Digital 100
2. Add services to portfolio

Questions

What are we trying to do?
How to get the results?
What organization has been set up?
What infrastructure will be required?



Digital: A group who are not behind others
existing in the same situation and to the
other side the page

- I think the intention of this - will be to make it
possible to see arrangements of the (things) like

that has gone on and it (things)

line of what is done and not a list

- about (things)

- (things)

Important to know what is done and (things)
- migration to (things)

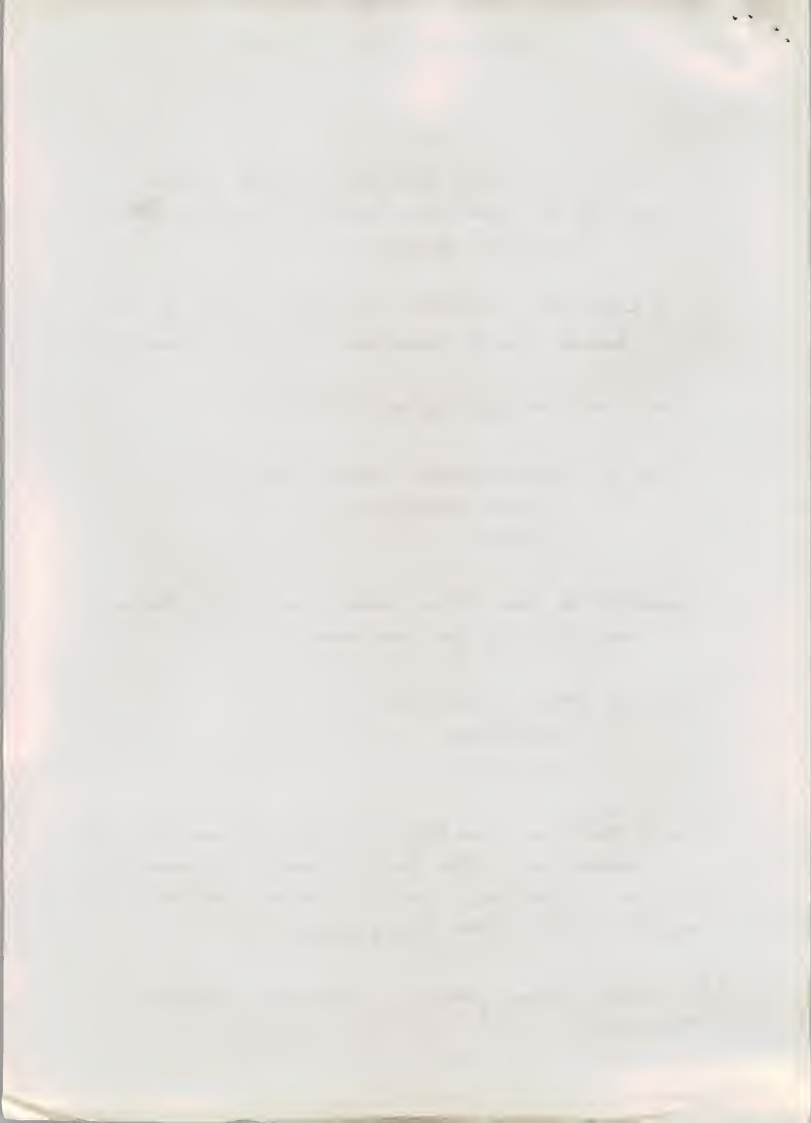
Issue of timing of investment in

- technology

- marketing

- Issue of resistance - some people don't like (things) with
carriers (in the business world) (things)
resistance. These people believe (things) will spread (things) in
competition of they don't (things) (things)

Where should they position themselves (things)
(things)



Schedule

April 1 - practice
March 23 - give past exam
Mar 28 - paper
Feb 7 - final

Final exam location is 10, Saturday. Please 10 by the
university like our previous quarters.

Need to look at papers - things are still in P.S.

Let us investigate relevant and relevant documents
about

Like statistics about possible effects and effects. Especially
big 150s etc. Patients' volume, especially, usually
about 1000.

Could get some more information about 1500.

Specific report contents

- relationship with direct general/primary/secondary
data is important in what kind of these papers to

What is the map/figure for the process?

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7-1

FOIA(b)(7) - INFORMATION NOT AVAILABLE

EXAMINING REPORT

WORLDWIDE INFORMATION RESEARCHING

Worldwide Information Researching is a private company
for business research and information services.

BACKGROUND & IDENTIFICATION: WORLDWIDE INFORMATION RESEARCHING

Worldwide Information Researching is a private company which provides research and information services to its clients. The company was founded in 1974 and is currently located in the United States. The company's services include research and information services for business and industry.

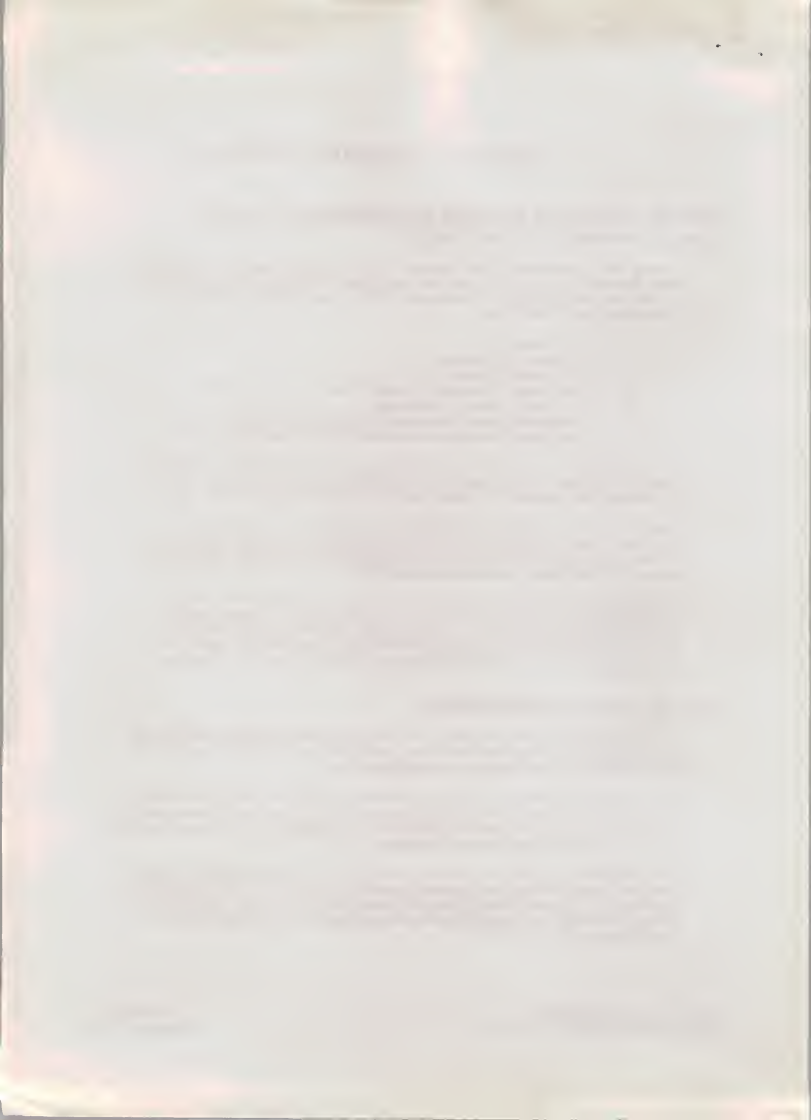
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Worldwide Information Researching is a private company which provides research and information services to its clients.

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Worldwide Information Researching is a private company which provides research and information services to its clients.







WORLDWIDE INFORMATION OBJECTIVES, STRATEGIES, &



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DIGITAL CONFIDENTIAL

DIGITAL Equipment Corporation

Proposal

for

Wide Area Network and Communications Services

Introduction

DIGITAL's Corporate Telecommunications (CT) organization has developed an internal business proposal to provide Wide Area Network and Communications Services to support the System Integration business. To complete this proposal, CT requires a market assessment of the sales and profit potential and competitive positioning of this service offering. The following information is being provided to target and focus the development of such a market analysis.

Document Purpose

This document provides a summary description of the Wide Area Network and Communications Services proposed for sale by DIGITAL's Corporate Telecommunications organization. This description positions the proposed service offering with regard to DIGITAL's portfolio of Systems Integration services, and highlights the unique added value of this service to potential customers. Finally, key business strategies intended to target and focus the introduction of this service offering are indicated.

Service Description

DIGITAL's Wide Area Network and Communications Services provides a portfolio of transmission transport, network routing, and network application services for global, wide area network and communications systems interconnection. These services enable DIGITAL to offer end to end connectivity solutions as part of the Systems Integration portfolio. They will be provided via DIGITAL's existing global network and communications infrastructure. This infrastructure of equipment, circuits, software and people is currently installed in 36 countries worldwide and would be expanded to meet incremental customer demand.

The portfolio of proposed services is indicated in Figure (1). This portfolio includes primary services - those that CT believes are of the immediate interest to potential customers, and secondary services, those that CT is prepared to offer but do not represent what we believe represent our primary competitive differentiation. The portfolio also indicates which services CT is prepared to offer



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in the time periods of Fiscal Year 93 - 95 (DEC's FY runs July-June) and which services are expected to have a limited duration of demand.

Figure 1.

Wide Area Network and Communications Services

```

|-----FY93-----FY94/5-----|
-----
P      OSI----->
R      Transmission----->
I      Frame Relay----->
M      EMail----->
A      VideoText----->
R      Directory/Naming----->
Y      File Transfer
      Public Network Access----->

S
E      Video----->
C      Voice----->
O
N      TCP/IP-----|
D      DECnet IV-----|
A
R
Y

```

Service Positioning

The Digital Services organization currently provides Systems Integration services. These services cover the life cycle of customer requirements from Planning and Design, through Implementation and Management (PDIM). These services include the integration of network and communications systems and well as computing and information systems and applications.

The Wide Area Network and Communications Services proposed by CT complement DIGITAL's existing Systems Integration services by providing an existing infrastructure which can be used to rapidly implement global information systems solutions. The CT proposed



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services focus on wide area network requirements, not LAN's (which are provided by other DIGITAL organizations), and are derived from a communications infrastructure rather than consulting services.

We believe that the combination of consulting services provided by Digital Services, and Wide Area Network and Communications Services provided by Corporate Telecommunications, will provide a powerful and comprehensive communications solution to our Systems Integration customers.

In addition to the unique support provided for emerging technologies, this service offering from DIGITAL provides our customers with the benefits of rapid deployment and ease of use.

Since DIGITAL has a global communications infrastructure (equipment, circuits and people) in place, our customers will benefit from the rapid deployment of their solutions using DIGITAL provided services. In addition to reduced deployment times, DIGITAL's network and communications services provide quality improvements over traditional leased lines through designed in network redundancy, contingency planning, and global network operations management.

The complexities of designing, implementing and managing such network systems cannot be understated. DIGITAL's existing staff of skilled specialists will assume the responsibility of managing this complexity on behalf of our customers.

Introduction Strategies

The following strategies have been described to target and focus the introduction of the Wide Area Network and Communications Services.

- 1) DIGITAL is a total solutions provider in the Systems Integration business. Simple "Bandwidth" resale independent of a total informations systems solution should not be considered as an element of this business plan.
- 2) During the initial introduction of this service, CT prefers to target a few customers in a few geographic locations, rather than many customers in many locations.
- 3) This service will be positioned as a complement to the total Systems Integration portfolio, and will help to differentiate DIGITAL as a Systems Integration provider, particularly with customers who have OSI requirements.



PROPOSAL

Service/Product

Wide Area Network and Communications Services

- Transmission Transport
- Network Routing
- Network Applications Services



Wide Area Network and Communication Services

|-----FY93-----FY94/5-----|

P	OSI----->
R	Transmission----->
I	Frame Relay----->
M	EMail----->
A	VideoText----->
R	Directory/Naming----->
Y	File Transfer----->
	Public Network Access----->
S	
E	Video----->
C	Voice----->
O	
N	TCP/IP-----
D	DECnet IV-----
A	
R	
Y	

Figure 1.

D. Cedrone 24_JAN_92



Service Availability

Transmission Transport

IDN Service Locations

E-IDN (Frame Relay) Service Locations

Private Line Service - Global

Switched Services - Global

Packet

Circuit

Network Routing

Easynet Service Locations

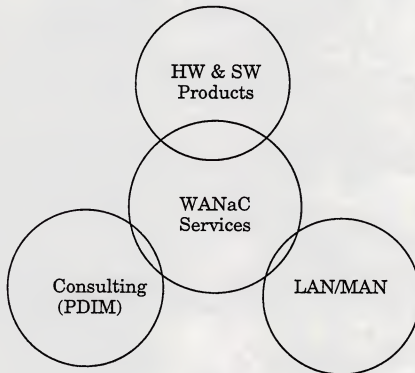
Network Applications Services

Easynet Service Locations



Service Positioning

Global Systems Integration Portfolio





Benefits

- Speed of Deployment
- Leverage Installed Infrastructure
 - Economies of Scale
 - Capital Equipment
 - Skilled Human Resources
- Unique Technology Support
 - OSI
- Network Applications Support
 - Mail
 - Video Text
 - Directory Naming
 - File Transfer
 - Public Service (Gateway) Access



Rollout Strategies

- Transmission
 - Total Service Solution
 - NOT Bandwidth Resale
- Network Services
 - A Few Targeted Customers
 - in
 - A Few Geographic Locations
- WANaC
 - Complement to the Systems Integration Portfolio



INPUT

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CONTACT REPORT

 INPUT
 Staff: Init. PAC Init. _____ ☐ INPUT office ☐ Client Office ☐ Other _____
Contact Date: 1 / 15 / 92Date Written: 1 / 15 / 92

Company <u>DIGITAL</u>	DISTRIBUTION:			Prog./Proj. ID
Name <u>CHERYL MORRIS</u>	Action	Info.	By When	Describe Action-F/U
Title <u>SUSAN</u>				
Address <u>Susan's #</u>				
Phone: (508) 952-3913				
Fax: () -				

- strategy.*
- Susan runs the corporate Telecommunications group. Last August Cheryl and I met to discuss ways in which DEC could offer certain internal services for sale.
 - Susan is responsible for internal and external strategies for telecom. business.
 - Wants to look at pros and cons of doing this - there are constituencies in U.S. and Europe for and against this.
 - Two types of services: a) capacity transmission lines, DN, raw circuits b) value added services, e-mail, etc. data, some voice.
 - Cheryl suggested INPUT to work on this to perform external, objective analysis.
 - Areas of coverage: 1. U.S. 2. Europe 3. ~~the~~ Pacific Rim.
 - Voice is not focus - would only offer if it was part of the total sol.
 - Service data network can offer mail, videotex, file transfer etc.
 - Unique ATTRIBUTE: Have OSI network architecture.
 - Timing - they were meeting 1 p.m. Will define general questions.
 - Want from us: potential and realizable market sizes
 - key buying industries, - competition (channels, profit margin models, current and emerging competitors, opportunities/benefits, Need near, ~~short~~ mid-term and long term view)
 - W/OT build business case for and against entry into markets.
 - Would want results in their format - ~~report~~ for easy use by the business development.
 - Also have someone (John Smith) looking into legal and regulatory issues.

☒ Continued over



2. Customer Type: ☐ Vendor ☐ Others ☐ Media ☐ User3. Newsletters: ☐ EDI ☐ Field Service ☐ Other4. Vendor: Vendor Type—☐ Client ☐ Former/Report Client ☐ Prospect• Contact Level—☐ Executive ☐ Acquisition ☐ International ☐ Other• If Exec. or Other Contact Level—☐ Maintenance ☐ Equipment ☐ Communications ☐ Others ☐ Info. Svc.• If Info. Services—☐ Turnkey & Software ☐ Network & Processing ☐ Systems Integration ☐ Professional Svc.5. If User: User Type—☐ Client ☐ Former/Report Client ☐ Prospect• Comm. Contact Level—☐ Executive ☐ IS Mgmt. ☐ Other• Fed. Contact Level—☐ Executive ☐ Acquisition ☐ Prog. ☐ Manager/Technical ☐ Other• If Fed. Executive—☐ Info. Resource Mgr. ☐ Asst. Secretary ☐ Commander (Military) ☐ Agency Head• If Fed. Other—☐ Laboratory ☐ NIS ☐ Users ☐ GSA

* No names will be added without a completed change order and program manager approval.

Program Manager
Authorization _____

CONTACT REPORT

Continuation

Company _____

Name _____

But they went us to identify any economic/regulating issues they should be paying attention to. I said we were not experts in this area - we would get our info. from interviews.

• There are mixed views in the company on what is good viable business for them. Need objective analysis

• How do they differentiate themselves

• Do not want to be like Bambi in film 'Bambi and Goliath' where Bambi gets crushed at the end!

• They will help us with program

• Susan is in charge of project - she is in Middleton

• She is leaving Feb. 9 on trip - would like to get this under way before then.

• Timing 4-6 weeks - Mar 15 to Mar 30 for completion

• Possible meeting next week Fri. Aft - Phillie can help organize. If I come in Thursday evening we could talk about "breakfasts".

• Involve network research people in Europe like Leon. Pike Langey, U.S. Tom O'Flaherty (possibly Denay Weyman).

• Will have some inputs for us this week - they were having meeting at 1pm today.



The public/private tug of war

By John Gantz

"It has been a thousand times observed, and I must observe it once more, that the hours we pass with happy prospects in view are more pleasing than those crowned with fruition."

—Oliver Goldsmith, *The Vicar of Wakefield*, 1766

"Every increased possession loads us with a new weariness."

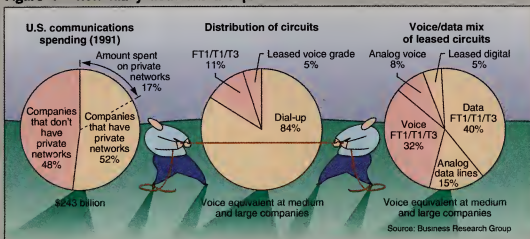
—John Ruskin, *The Eagle's Nest*, 1872

Two hundred and one hundred years in advance, the sentiments of Goldsmith and Ruskin captured the plight of those organizations operating private networks today. Possession of network facilities provides control and flexibility, but with it comes the weariness of management, support, and continual design changes. The hours spent with happy prospects in view—i.e., the justifications for building those private networks—were surely more pleasing than is the day-to-day reality of managing and owning a private network in a world where technology changes at lightning speed, users demand more services on the spur of the moment, and carriers change tariffs (and hence, trade-off equations) with regularity.

Indeed, recent surveys show that almost 20% of private network operators aren't sure they'd build a private network if they had it to do over again. But it's not clear they had much



Figure 1 How many networks are private?



With \$40 billion of the U.S. communications budget for 1991 going to private networks, it's clear that new switched services won't eliminate private networks overnight. Surveys also show that when it comes to private networking, data considerations far outweigh those for voice.

choice. The decision to build a private network—to own and operate the switches, lease the lines, or own the microwave towers—has almost always been an economic one. If the traffic was there and economies of scale in transmission and switching were there, then private was the way to go. In the case of data networks, private lines were often the only way to ensure line quality and, hence, low bit error rates.

But that's all changing. Today's network designers and planners are in a tug of war. On the one hand, they like the security and control of private networks; on the other, they're being told by carriers and service providers that a new day is dawning. They'll be able to have the security blanket of a private network with the flexibility of a public network.

Network managers are already aware of the ways they can use the public network for voice traffic and still maintain the illusion of private networking—thanks to virtual private networks and special tariffs for custom services offered by the vendors. But now they are learning that the future will bring new data networking services—frame relay (fast packet), SMDS, and software defined data networks—from the telephone companies. Not only that, but the carriers are for the first time letting their customers interface with internal operating systems, offering one-stop shopping for global networks, and even offering to run their private networks for them.

All of this puts the decision makers in a quandary. They must ask themselves a

number of questions before they make their network decisions—decisions, by the way, that network planners, designers, managers, and users will have to live with for years. For instance:

- Will the data and voice (or integrated) networks of the 1990s be carrying such traffic that they will actually *require* the resources of a public carrier?

- Can public network providers be trusted to manage networks that were formerly private? Do they understand the business issues involved? Do they feel it when the network goes down?

- Do virtual private networks offer the same level of reliability and availability—or more, or less—that true, customer-owned private networks do?

- Do the economic advantages of implementing hybrid networks—part public, part private—outweigh the difficulties of managing both types of networks as one?

The answers to these questions will determine the course of networking for much of the 1990s. Unfortunately, this is not a crossword puzzle, and the answers don't appear somewhere on the back page of the magazine. The definitive answers lie somewhere in the future; all we have now are provisional answers. And in this crazy industry, those don't always last long.

How big is the issue? Of the \$243 billion spent last year in the U.S. to operate communications networks—including staff salaries, line charges, equipment leases, and depreciation—just over half was spent by companies whose networks are at least somewhat private (see

Figure 1). According to surveys by Business Research Group (BRG) of Newton, Mass.—the company that supplied the spending data—about a third of the network costs at those companies that did run private networks went to support those private networks. So, we're talking about \$40 billion spent in the U.S. alone, probably double that worldwide, on private networks.

According to these same surveys of medium and large-size companies—those most likely to consider going private—circuit distribution mirrors that spending figure, with about 16% of circuits being either dial-up or some version of wideband (on a voice equivalent basis). Of those leased circuits, though, 60% are used for data. In fact, as my Commentary in the September 1991 issue pointed out, more than half of all data transmission circuits are leased. On the voice side, fewer than 15% are leased. Not surprisingly, since the carriers have begun selling T1 and fractional T1 circuits, private networks have migrated rapidly from regular leased analog lines to wideband.

At the same time that wideband has soaked up traffic from analog leased lines, dial-up services have become more attractive. Comparing two similar surveys by BRG—one from 1988 and one from 1991—shows that the number of dial-up voice circuits terminating at user premises grew 23% in three years (see Figure 2). Even more striking, the number of dial-up data circuits grew 25%, accompanied as we know by growth in the dial-up modem

"Users have got to love the plug and play of the new DEC products; the fact that users can set up the systems in about 30 seconds is great and the products should sell well on that basis alone."

—Doug Gold, director of communications research at International Data Corporation, as quoted in *LAN TIMES*, April 15, 1991



uct. DEC has used its miniaturization and packaging engineering talents to, in effect, create the industry benchmark example for the right way to design a complex communication product acceptable for use in an exposed commercial workplace as well as a telephone closet . . ."

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—*Business Week/Industrial Designers Society of America Awards*, June 17, 1991

"It is my belief that the DEChub™ 90 product is one of the finest examples of the use of state-of-the-art 'siliconization' techniques to implement a multi-function communication connectivity prod-

—Frank Dzubeck, president, Communications Network Architects, Inc., October, 1991

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market and the spread of communicating PCs. Even given the differences in survey populations polled, these numbers represent an impressive change.

Deciding to go private. Companies have built private networks for a number of reasons. For one, the aggregation of traffic onto backbone networks offered economies of scale that were too attractive to pass up. The drop in T1 costs—50% in the last five years—and the introduction of fractional T1 circuits for lease helped keep those economies attractive. In addition, ownership of equipment and facilities allowed companies to project future costs and deploy resources as they saw fit. Ownership also offered companies, in some cases, a flexibility and competitive advantage that carrier-based alternatives did not, and simplified contractual arrangements across the globe in support of planet-wide networks.

On top of these considerations, the post-traumatic stress syndrome suffered by telephone companies after divestiture convinced major users that they'd be better off running their own networks. Added to that, some services, such as high-speed highly reliable data or custom billing and numbering arrangements, were unsupported or uncompetitive in carrier offerings. Finally, the data networking

product suite was geared toward networking over dedicated lines.

Indeed, the cost model for private networking always favored companies with certain traffic characteristics and enough volume to beat the minimum traffic thresholds. Because users can build their own facilities, carriers have to keep matching the cost of ownership with leased alternatives. This goes back to the Telpak days, when large companies got huge bulk discounts on leased circuits. As the underlying technology gets cheaper, that cost of ownership keeps dropping.

But life on the network is changing. Although some of the economic justifications for going private are still there—depending on traffic characteristics and volumes—a lot of the others are not. And depending on the types of discounts and extended purchase agreements carriers offer on virtual private networks, the economic case flip flops. Public networks disguised as private can easily be cheaper for companies with more than \$40,000 a month in long distance phone bills.

Indeed, over the last several years carriers have added features to their public offerings, particularly their virtual private networks, that blur the lines between public and private networks. These include the following:

- the capability to let customers reconfigure their networks from their own technical control centers;
- custom tariffs, typically AT&T's Tariff-12 and the MCI and Sprint analogs;
- customer-controlled call routing;
- automatic provisioning;
- service-level and provisioning commitments; and
- customized billing through which the phone company bills a company's divisions directly.

This last service, designed for large users, has led to the proliferation of aggregators—companies that order lines on behalf of others and, after getting the bulk discount, pass on the charges plus a mark-up. By offering to do the billing for what looked like large customers (in terms of traffic volume), carriers made the aggregator business possible.

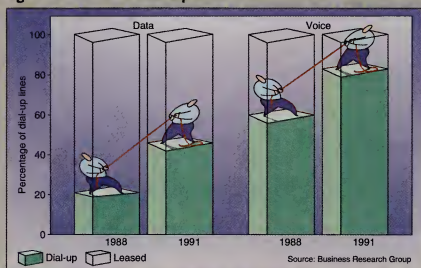
Another motivator for building and maintaining private networks has always been reliability. According to surveys by BRG, the ratio of lost business revenue per hour to communications spending per hour is 140 to one. At medium and large-size companies, a lost hour of business equates to more than \$375,000.

This issue has gotten more complex over the last several years. As the CO fire in Hinsdale, Ill., several years ago demonstrated, even private networks aren't immune to telco problems. It turns out that the Hinsdale CO was also a major thoroughway for trunk circuits that carried private line traffic. The New York City outage last September, which torpedoed air traffic control systems at the major nearby airports, also showed the vulnerability of private networks based on leased lines. Reliability issues aside, there's no doubt that the carriers are becoming more competitive with their switched services than they used to be.

The data traffic mandate. Another factor that comes into play, particularly in data networking, has to do with the nature of the traffic carried. At divestiture, the predominant data traffic carried was pumped through large computer terminal networks—data entry, reservations, teller terminals, and so on. It tended to be steady, predictable, and consistent.

Networking Management has already documented how much this data networking scene is changing and will change over the next five years as a result of new computer applications and LAN-to-LAN

Figure 2 Growth in dial-up lines



More than 500 responses to a survey of medium and large companies reveal growth in the use of dial-up voice-equivalent lines for both voice and data. This surge is attributed to the increased attractiveness of dial-up lines for data and an expanding dial-up modem market; the growth of virtual private networks; and the substitution of voice-grade leased lines with T1, fractional T1, and T3 lines.

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The changing trade-off between public and private networks

	Past		Future
	Public	Private	Hybrid
Ownership	Carrier	User	Carrier, user, third party, consortia, or combination
Configuration/provisioning	Carrier	User	Some user control of carrier resources
Prices	Increase over time	Fixed by sunk cost	Infinite variety of volume and multi-year discounts, multiple vendors
Operations	Carrier	User	Integrated carrier/user systems, third-party management tools, custom billing
Predominant architecture	Dial-up services	Leased or owned facilities	"Virtual" networks—shared facilities that appear leased
Economic trade-offs	Ease of management and provisioning versus lower cost for customer ownership		Complex evaluation of pricing lock-ins versus discounts and flexibility to deal with variable traffic

Thanks to competition and technology advances, carriers are offering better pricing and flexibility to switched services customers, particularly those with virtual private networks and special-tariff custom networks. The choice is no longer between public and private networking, but among many complex alternatives along a spectrum of possible combinations.

networking. Some examples of this include the following:

- Session lengths that used to be predictable, and would last for seconds or minutes in support of order entry and data base inquiry, will become unpredictable and last from microseconds to hours in support of client/server and distributed computing, LAN-to-LAN communications, and messaging

- Burstiness will become less predictable as networks go from handling one type of traffic, generally message response, to handling everything from messages to large file transfers.

- Message sizes will grow from an average of 2 kilobytes to gigabytes.

- The bandwidth demand at the terminal will increase dramatically—these things are really mainframes on a desk now—as will demand for general LAN-to-WAN-based bandwidth.

- Response times on the network will drop from subseconds to below 300 milliseconds to support reasonable response times at the desktop in LAN-WAN-LAN networks.

Some things won't change, of course, such as the need for high reliability to support mission-critical applications and the need for flexible reconfiguration to handle changes in applications, mergers and acquisitions, and other corporate flux.

The core issue is that we are asking so much more of our computers and terminals these days that they, in turn, are asking more of their networks. As Figure 3

illustrates, the span of variability in terms of bandwidth and session length for some of the advanced applications that lead users are now implementing is three orders of magnitude greater than that required just one depreciation cycle (seven years) ago. Building networks to support these new applications means building networks with significantly different peak-load-to-average-load capacities—perhaps too much of a difference for many users to swallow.

The change is not so dramatic on the voice side. In fact, as an increasing amount of corporate traffic is related to advanced call center applications, voice mail, and voice response, the requirements on the network get *more* predictable. About the only thing that changes, besides calling volumes and an increase in the reliability requirement, is that the new kind of phone calling supports revenue generation and client satisfaction.

As a result of this divergence in the types of traffic generated by voice and data applications—and, to be honest, the difference in quality between carrier virtual private network offerings for voice and data—the trend of integrating voice and data networks has reversed. Companies are increasingly putting their voice traffic back onto the public network, and are using the resulting private network capacity to handle their growing data needs. (According to market analysis done by Vertical Systems Group of Needham, Mass., this was one of the reasons the T1

multiplexer market softened last year. Incremental demand for switching was siphoned off to the dial-up network, lowering demand for new switches.)

The virtual networking romp. While the decreasing demand for leased T1 circuits has given private networking its boost, that boost has been countered by the advent of the virtual private network. From a revenue base of practically zero in 1988, virtual networks have become a \$2 billion business in the U.S., according to figures from San Jose market researcher Dataquest (see Figure 4). What's more, those revenues are expected to be over \$5 billion by 1995. Compared to the leased line portion of the \$40 billion private network market we talked about earlier, that's significant penetration.

The rule of thumb is that a company spending more than \$25,000 a month on long distance might be a candidate for virtual networking. Compared to leased lines on a multi-location plan, virtual networks begin to pay off at 5000 hours of monthly usage, not counting discounts (see Figure 5). Costs can be even lower if circuits are purchased through an aggregator, although events of the last several years have shown that there's risk associated with that reward. Many thinly capitalized aggregators had to leave the business when the carriers had trouble handling the wave of demand that their new billing arrangements generated in 1990.

Since the early days AT&T, Sprint, and MCI have tightened up on discounts, and

set limits on how many sites they'll sign up in a month and how many new phone numbers they'll agree to bill as part of their multi-location billing. But they still offer generous discounts for long-term service commitments. Signing up for five years at a preset volume commitment might mean saving almost 40% on published rates.

The carriers, meanwhile are offering other services to entice customers into the virtual networking fold. These include the following:

Virtual data networks—Starting in 1990, the carriers began offering virtual data networks, albeit at generally higher per-circuit costs than for voice. This service may, however, take more traffic from dial-up than from dedicated facilities.

Global virtual networks—All of the major carriers now offer limited subsets of their U.S. virtual networking in the international setting, generally through arrangements with in-country carriers and PTTs. Many announced new strategic partnerships with PTTs at last fall's Telecom '91 show in Geneva.

Syncordia, a subsidiary of British Telecom still seeking to finalize arrangements with the German PTT, Japan's NTT, and other carriers, intends to do so by building its own global private network and offering outsourcing. Within Europe, the national

carriers are also establishing themselves as one-stop shopping centers for telecommunications. Even IBM is rolling out an international consulting service that may include outsourcing for customers, which would put it in competition with some of its communications partners.

Special tariffs—AT&T and competitors continue to sell custom networks, generally based on software-defined capabilities, to large customers. They have, additionally, expanded the services they provide to customers (for a fee) to include network design and engineering, system administration, and facilities management. These outsourcing services can be especially attractive to companies looking to build global networks. Outsourcing, in fact, extends the concept of the public network beyond the usual boundaries. The services provided by the carrier can be so customized in these outsourcing arrangements that it's hard to tell whether it's a public network or a private network managed by a third party.

The point is that the carriers, in an era of heightened competition and in their desire to increase bonds with key customers, are willing to go to lengths unheard of in pre-divestiture days to meet customers' needs with tailored service levels, capacity, billing, and administration. The question is, can they manage a company's

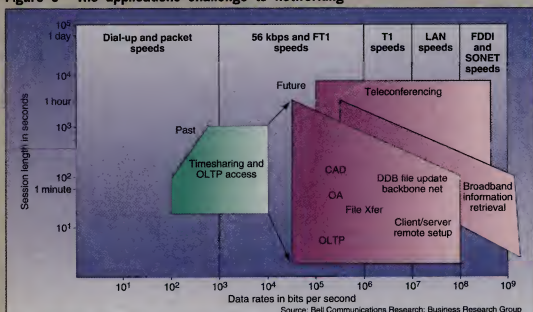
private network better than the company? Certainly they would like you to think so.

Enter the hybrid network. The truth of the matter is that, in the tug of war between public and private networking, most medium and large companies will end up somewhere in the middle with a combination of both. Remember that at the companies representing the 52% of the market with private networks, those networks only accounted for a portion of the total networking budget.

With the advent of virtual networks has come a new concept—the hybrid network. Switch and signaling technology now allows for the integration of private and public networks. What makes hybrid networks different from current private-public combinations is that hybrids offer the same level of service across the network to all users, despite the fact that part of the network is public and part is private. This wasn't always the case.

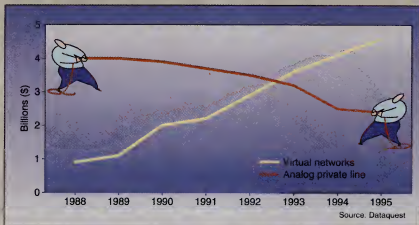
Hybrid networks allow companies to do away with on-net/off-net discrimination, whereby some company sites have different dialing plans and levels of service than others. Where old-style private networks charged low-volume sites the same per-circuit costs for leased lines as they did high-volume sites, hybrid networks allow low-volume sites to pay on a usage basis. This, in turn, makes it more economical to

Figure 3 The applications challenge to networking



One of the reasons managers may have to turn to public carriers to support data networks is the increased bandwidth and variability of the data traffic generated by new applications. Few organizations will be able to engineer and build private networks that are capable of handling such a variety of speeds, file sizes, and interactivity.

Figure 4 Growth in virtual private networking



Despite its nonexistence in the market in 1987, virtual private networking has become a \$2 billion business for the carriers. At the same time, analog private line revenues are slowly waning.

put low-volume sites onto the net. High-volume sites remain connected by leased lines, and low-volume sites use virtual leased lines.

The best candidates for hybrid networks are organizations with multiple sites, some large and communications-intensive, others not. But the decision about which part of the network should be private and which public is not always based solely on traffic volumes. It may also be related to traffic type. Companies may prefer to keep data such as mission-critical reservations and funds transfer on the private net.

So here's the current picture: companies are offloading voice onto the public network; virtual networks are increasingly attractive for voice and some forms of data; data traffic is growing much faster than voice and is demanding more of the networks; in fact, data traffic is beginning to dominate network design; and carriers are offering more customized services, up to and including outsourcing of private networks.

In short, the tug of war between private and public networking is less a tug of war than a matter of choosing from alternatives along a spectrum of choices—from dial-up service to hybrid networks to private networks to outsourced networks and all phases in between.

"I don't think there's any question," says Jerry McDowell, a senior telecommunications analyst at Dataquest, "that the number of hybrid networks will in-

crease dramatically. It's already happening. But the trade-off equations are getting more complex all the time, and the permutations and combinations open to users for mixing their private networks with public services are almost infinite."

Indeed, several nontrivial costs are associated with merging public and private facilities into the same network. They include evaluation and negotiation costs, particularly of outsourcing or special tariff arrangements; access to the virtual net points of presence; penalties for not hitting agreed-upon volumes in extended pricing plans or for terminating pricing programs early; and overhead for managing both sides of the network.

Managing hybrid networks. The difficulties in managing hybrid networks arise because of basic incompatibilities between the management systems of private and carrier networks. Actually, the difficulties are not so much in managing the component pieces—the two types of networks have been around for years—but in understanding what's happening at the interface.

Today, the carriers offer plenty of tools for customers to manage their virtual nets from their own tech control centers. For instance, the carriers allow customers to interface through special front-end systems directly with their own operational support systems (OSS). From a workstation at the user site customers can add or delete network addresses, change routing algorithms, reconfigure the network, and

request new lines. (Unfortunately, they can't usually check on problem status because their network diagnostics don't work on the carrier's portion of the network.) Since one of the ways carriers differentiate themselves is through customization of these types of services, they are bound to improve through the decade.

This interface will get easier over time as carriers and private networks continue to migrate to out-of-band signaling and as both settle on common network standards, like OSI's CMIP, allowing the private network management systems to work directly, without human interface, with those of the carriers. The use of common protocols and signaling will also permit the management of multiple carrier networks from the user's system, making it easier to plug multiple virtual nets into the overall network. Some carriers already offer direct connection between their network management systems and those, like IBM's NetView, for private networks.

Last year, a number of U.S. carriers even started to let key customers connect directly to their Signaling System 7 networks, to provide them with shorter call set-up times and allow them to make real-time routing decisions. Soon, there will also be ways for customers to control public portions of their networks via the interface between their CPE and carrier switches when running ISDN or new services like frame relay. These services have special channels for transmitting management and control information.

Until all these interfaces are perfected, and until all the carriers support higher levels of interconnection with their OSSs, there will be some messy problems at the interface of public and private networks. These problems include troubleshooting when data messages can't pass from one part of the network to another, yet all the hardware seems to be working; mixing billing and usage information from multiple carriers and switches from different manufacturers; and end-to-end testing of circuits or packet routes.

But customers are finding ways to live with the management issues of running hybrid networks. And over time these networks should get easier to deal with, particularly as ISDN and standards-based services like frame relay come into vogue.

Will broadband tip the balance? Looking at the bandwidth demands and increasing variability of data traffic we can

expect in the 1990s, one wonders whether users will be able to afford to build and engineer private data networks, particularly in support of LAN-to-LAN connections. Users have discovered, for instance, that they can save a significant amount of money by replacing their traditional hierarchical data networks with meshed networks of routers, generally connected by private T1 lines.

But they are also discovering that complexities and performance degradations increase as these networks grow. As they begin putting even backbone SNA traffic onto these multiprotocol router networks, users find they are getting closer to exceeding the performance envelope. And the risks are getting greater.

Salvation may come in the new carrier-based data services being offered, chief among them frame relay and SMDS. Frame relay is discussed in a special section in this issue, and therefore is not covered in depth here. However, it's worth noting that while most frame relay services now offer only private virtual circuits, which look to the end points like a temporary leased line, these services will evolve to offer switched virtual circuits, or any-to-any communications.

For LAN-to-LAN connections, the new broadband services—particularly those that will come on stream later in the decade—will offer more than increased

bandwidth. Because SONET-based wide area networks will use the same underlying protocol as metropolitan area networks, which, in turn support LAN protocols, the interconnection will be much more seamless than it is now. Workstations on one LAN will be able to access servers on another LAN across the country as if they were local.

The real issue for users is whether to wait for SMDS or to start with frame relay. Both offer the advantage of diminishing the cost of meshed router networks by reducing the number of connections between routers, and both bring fast-packet performance to LAN-to-LAN connections. But where frame relay is connection oriented, SMDS is datagram oriented and doesn't require call set-up. Also, SMDS is generally expected to be faster and to be able, eventually, to support video and voice traffic. By design, SMDS will be able to handle very large internetworks, with thousands of end points and broadcast applications.

At the moment, frame relay seems to be the service of choice. Many vendors have announced support for it in their termination equipment, PCs, terminals, and muxes and at least five carriers have announced frame relay services. But in the long run, SMDS may actually offer more to users because it will support higher speeds, will be more efficient in very large

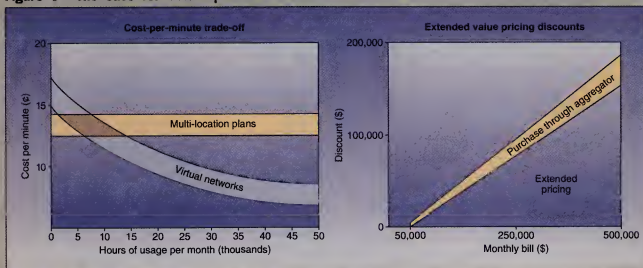
networks, and is more amenable to being provided by carriers as a shared service. Not only that, but it offers built-in support for B-ISDN.

The issue for users, then, may be the speed and competency with which the carriers deploy the services. Most RBOCs are expected to tariff SMDS services this year; at least one independent telco, Centel, has an FDDI-based MAN service tariffed; and several long distance carriers are expected to offer SMDS support this year. This last capability is important because early field trials and new market research by the RBOCs indicate a greater need to handle interLATA SMDS traffic than originally thought.

But if the RBOCs don't do a better job of marketing their SMDS services—getting the share of mind of their own salespeople and outside agents and better understanding customers' data needs—then SMDS deployment may go as slowly as ISDN deployment has.

"While there's debate over whether frame relay or SMDS will be the best alternative," says Dr. John McQuillan of McQuillan Consulting (Cambridge, Mass.), "I think it's pretty clear that users will have to turn to switched services to raise the ceilings on the networks. LAN-to-LAN traffic is quite bursty, and I think most users would be well advised to use the switched services to provide bandwidth on

Figure 5 The case for virtual private networks



Although the trade-off between switched services and virtual network plans is an ever-shifting equation, virtual network users get price breaks based on both volumes and multi-year commitments. Carriers, however, keep changing the prices and terms and conditions of their switched and virtual services.

demand to handle the peak loads. This will allow them to run applications they couldn't consider before because of network constraints. The use of these services can therefore be of strategic value."

The road map for users. Faced, as one wag put it, with an insurmountable wall of opportunity, users may well feel confused about the future. Who needs to worry about this stuff during a global recession,

when budgets are being trimmed and executives are talking about downsizing more than computer systems?

The fact is that we are at a watershed in the business of managing networks. We're at the beginning of a major phase of innovation that includes frame relay, SMDS, B-ISDN, virtual networks, and new business practices at the carriers. This innovation, once we have mastered some

of it, will pay off in networking flexibility and capability never available before.

Along with the way, users are advised to do the following:

- Stay up to date on carrier discom plans and examine them at least semi-annually. There are always cost savings to be found.

- Avail themselves of the new customer control options on the switched services offered by the vendors.

- Consider outsourcing parts of the networking job, particularly either stable parts of it or the troublesome parts that require the outsourcer's skills. Concentrate in-house efforts at the leading edge.

- Experiment gingerly with the global end-to-end services offered by carriers as of last year. Many carriers are not yet experienced in managing partners.

- Keep top management informed about new networking alternatives.

- Expect to operate a hybrid network; bring aboard the people and tools that requires.

No, it's not going to be easy, this choosing between alternatives. But it's going to be a lot more fun than going through divestiture—and with a bigger payoff. ■

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ee

COMMENTS:

Rev Schedule

THIS IS PAGE 1 OF

2

FROM:

Tom O'Plakerty

DATE:

Feb 17

INPUT Project
Charge Code:



V. SCHEDULE

The following schedule describes the activities by week. Both INPUT and Digital will have to make every effort to complete their activities in the time specified.

<u>Week of</u>	<u>Activity</u>
1/21 2/17	Digital provides verbal approval in principal for project
2/3 2/24	Preliminary work on project begins <ul style="list-style-type: none"> - Digital prepares lists of corporations - INPUT drafts interview guides - INPUT and Digital define project specifics further
2/10 3/2	Final approval INPUT meets with CT <ul style="list-style-type: none"> - Initial assessment of CT services to be offered - Review interview guides
2/17 3/9	Digital staff interviews completed INPUT meets with CT <ul style="list-style-type: none"> - CT Services assessment completed - Interview guide finalized Customer interviewing begins (U.S., Europe & GIA)
3/2 3/23	INPUT and Digital hold a progress review
3/2 4/6	Customer interviews completed INPUT conducts additional research, as required INPUT completed analysis of interviews
3/9 4/13	INPUT prepares a presentation version of findings and begins draft report
3/16 4/20	Preliminary review of findings with CT staff
3/23 4/27	INPUT presents findings in overhead transparency format
3/31 5/4*	INPUT delivers final report
3/31	INPUT presents findings to BTMC and to subsequent review meeting in April - June 15, 1992

* Or one week after initial presentation, if presentation is delayed

